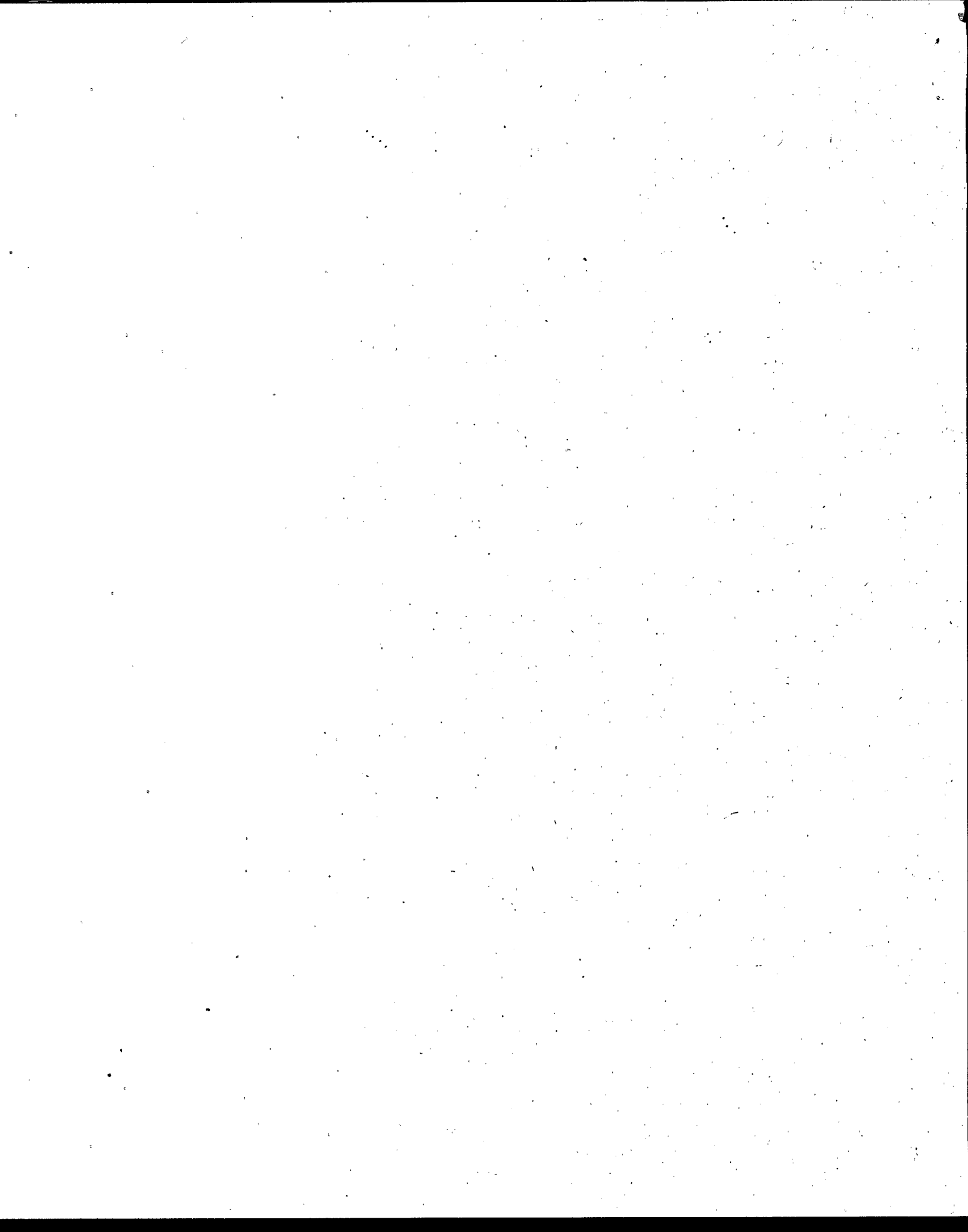




Draft Paper Products RMAN -- Supporting Analyses



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I. INTRODUCTION

The U.S. Environmental Protection Agency (EPA or the Agency) is publishing a draft Recovered Materials Advisory Notice (RMAN), which contains recommendations for procuring agencies to use when purchasing paper and paper products in accordance with section 6002 of the Resource Conservation and Recovery Act (RCRA). This chapter of the supporting analyses document explains EPA's objectives, EPA's process for designating procurement items and recommending procurement practices for those items, and EPA's methodology for recommending recovered materials content levels for paper and paper products.

In chapters II - V, EPA discusses the draft recommendations for newsprint, tissue products, paperboard and packaging, and printing and writing papers, respectively. In addition, in chapter V, EPA explains how the draft RMAN incorporates the minimum content standards for printing and writing papers established in Executive Order 12873. In chapter VI, EPA addresses other paper issues: definitions, measurement of recovered materials content, recyclability, and use of EPA's recommendations. In chapter VII, EPA provides a list of the information sources used to develop the recommendations in the draft RMAN. Finally, the draft recommendations are included in this document as an Appendix.

A. Objectives

In developing the draft recommendations for paper and paper products, EPA considered two objectives. As required by RCRA section 6002, EPA's first objective is to recommend content levels that will maximize the use of postconsumer recovered materials in paper and paper products. EPA's second objective is to promote paper recycling by increasing both the usage of postconsumer recovered materials in paper manufacturing and the availability of competitively-priced paper and paper products containing postconsumer and other recovered materials.

EPA recognizes that while its recommendations are meant primarily for the use of government procuring agencies, EPA's guidance is widely used by private sector purchasers, who represent 95% or more of paper demand. EPA has found that when its recommendations for postconsumer recovered materials content are too high, paper and paper products containing these high percentages are often unavailable to government agencies and private sector purchasers or are not consistently available throughout the U.S. Also, while some paper and paper products containing these high percentages of recovered materials are available, they are not price-competitive with other paper and paper products offered to government agencies and private sector purchasers. As a result, overall use of postconsumer recovered materials may not be maximized simply by EPA's recommending high postconsumer content levels.

Since designating paper and paper products as procurement items in 1988, EPA has found that increasing demand from both public and private sector purchasers has resulted in greater recycling of postconsumer recovered materials than simply increasing demand from the public sector. Therefore, in establishing its draft content recommendations, EPA sought not only to challenge mills to use postconsumer recovered materials, but to provide an incentive for mills to increase the availability to both government and private purchasers of reasonably-priced paper and paper products containing

postconsumer recovered materials. EPA believes that this approach will maximize the recycling and use of postconsumer recovered materials.

Therefore, to meet its twin objectives, EPA is adopting a different approach than was used in 1988 to recommend content levels for paper and paper products. As explained in more detail below, EPA is recommending two-part content levels, consisting of a **postconsumer fiber** component and a **recovered fiber** component. (See chapter VI for a discussion of these terms.) EPA believes that the two-part recommendations will assure that there is a demand for all recovered materials, including postconsumer recovered materials and those materials generated during paper converting and printing operations.

Further, EPA is recommending content ranges for each fiber component, whenever appropriate, to encourage increased purchasing of paper and paper products containing postconsumer and recovered fiber throughout the U.S. EPA recommends that government agencies specify that paper and paper products contain postconsumer and recovered fiber levels at the high end of each range, consistent with RCRA's requirement that agencies purchase the highest levels of postconsumer materials practicable. EPA anticipates that some private sector purchasers also will specify and purchase products with the higher percentages of postconsumer and recovered fiber. EPA anticipates that private sector purchasers may be able to find paper and paper products available only at the lower end of the ranges, however, because the large quantities of paper that these purchasers need will be manufactured mainly by mills that use only lower levels of postconsumer and recovered fiber. By using EPA's guidance, both government agencies and private sector purchasers can encourage their suppliers to provide paper and paper products containing the highest levels of postconsumer and recovered fiber practicable.

By establishing ranges, EPA is taking into account the manufacturing diversity that exists within the paper industry. The recommendations recognize that, in many grades of paper, larger quantities of paper and paper products are produced at mills that primarily use wood-based fiber than at mills that primarily use postconsumer and other recovered fibers. While it is not currently economically feasible for these mills to substitute high percentages of postconsumer fibers for the wood-based fiber, it is technically and economically possible for them to use lower percentages of postconsumer and recovered fibers. EPA believes that ranges will provide an incentive for all paper mills to maximize their usage of postconsumer and recovered fibers. This will lead to greater availability of competitively-priced paper and paper products for both public and private purchasers. In the long run, this approach will lead to greater demand for both postconsumer and recovered fibers.

B. The Procurement Guidelines Development Process

Section 6002 of RCRA establishes a government agency buy-recycled program. It requires each "procuring agency" subject to the statute to comply with its requirements with respect to "any purchase or acquisition of a procurement item." These requirements include an obligation to procure items composed of the highest percentage of recovered materials practicable except under defined circumstances. Pub. L. No. 94-580, section 6002(c), 90 Stat. 2822 (1976). Under section 6002(i) each procuring agency is required to develop an affirmative procurement program to "assure that

items composed of the recovered materials will be purchased to the maximum extent practicable." Hazardous and Solid Waste Amendments of 1984, Pub. L. No. 98-616, Title V, section 501(a) - (e), 98 3274-76.

RCRA section 6002(e) directs EPA to prepare guidelines for the use of procuring agencies in complying with the statute's requirements and to revise these from time to time. EPA has three responsibilities under section 6002(e): (1) to designate items that are or can be produced with recovered materials; (2) to recommend non-binding procurement practices to assist procuring agencies in developing procurement programs for recovered materials; and (3) to provide certain information on recovered materials and items produced from recovered materials. See National Recycling Coalition, Inc. v. Reilly, 884 F.2d 1431 (D.C. Cir. 1989).

Under the statute, responsibility for complying with the Act's requirements to purchase items with recovered materials content rests with each individual procuring agency. EPA's published recommendations are a first step for procuring agencies, but, as the statute indicates, they are recommended practices, not strict requirements. Procuring agencies must revise their own programs as needed to achieve the statutory goals.

The process EPA followed in developing procurement guidelines included *Federal Register* notices of proposed and final rulemakings and solicitation of public comments. The final guidelines, including the recommendations for use by procuring agencies, were codified in the *Code of Federal Regulations*. EPA's rulemaking efforts have proved to be increasingly time-consuming. Revising a guideline and publishing it in the *Federal Register* may take up to two years or more. EPA consequently determined that inclusion of its recommended procurement practices within the rulemaking effort delayed dissemination of current information about products with recovered materials content and is therefore inconsistent with the statutory objective of promoting markets for these products.

In order to expedite the process of issuing procurement guidelines, Executive Order 12873 directs EPA to change the procedure used for designating items and providing procurement recommendations. Under the Order, EPA is to issue a regulation, known as a Comprehensive Procurement Guideline (CPG), which will contain the item designations. EPA proposed the CPG on April 20, 1994 (59 FR 18852). In that *Federal Register* notice, EPA proposed to consolidate the existing product designations, such as the designation of paper and paper products, into the CPG, which will be codified in 40 CFR Part 247.

Executive Order 12873 also directed EPA to issue guidance documents, known as Recovered Materials Advisory Notices, which will contain EPA's recommendations for purchasing the designated items. In the April 20, 1994 *Federal Register*, EPA published the first draft RMAN, which establishes eight product categories corresponding to the categories used in the CPG. One of these categories, Part A, is reserved for recommendations for paper and paper products.

C. Paper Procurement Guideline History

1. The 1988 Procurement Guideline

RCRA section 6002(e), as amended by the Hazardous and Solid Waste Amendments of 1984, required EPA to issue a "procurement guideline" for paper. Further, RCRA section 6002(c) requires procuring agencies to purchase paper products containing the "highest levels of postconsumer materials practicable," as long as the products meet reasonable performance standards, are reasonably available, and reasonably priced. Section 6002(h) provides a definition of "recovered materials," which includes a "postconsumer" subset, to be used when purchasing paper products.

In 1988, EPA designated the category "paper and paper products" and provided guidance for purchasing items within this category (40 CFR Part 250, 53 FR 23546, June 22, 1988). This category includes all paper and paper products except building and construction grade papers.¹ EPA recommended minimum content levels for five broad subcategories of paper and paper products: high grade bleached printing and writing paper, newsprint, tissue products, unbleached packaging, and recycled paperboard. Although EPA provided recommendations for many papers and paper products within these subcategories, the Agency did not provide recommendations for all of the many papers and paper products manufactured by the paper industry, either because government agencies did not purchase the items or because of performance, availability, competition, or price constraints. In the draft Paper Products RMAN, EPA is issuing draft revisions to the 1988 recommendations and draft recommendations for additional papers and paper products.

As shown in Table 1, EPA recommended postconsumer minimum content levels for products in all subcategories except printing and writing paper. At that time, for technical and economic reasons, few manufacturers of printing and writing papers used postconsumer materials in their products. This was particularly true of the large, integrated paper mills (i.e., mills producing both pulp and paper). Therefore, EPA recommended that procuring agencies use a 50 percent "waste paper" content level for printing and writing papers. (See 53 FR 23554-23555, June 22, 1988.) Because of concerns about availability and competition, EPA did not recommend content levels for high-speed copier paper, forms bond, and computer and carbonless papers. In addition, EPA did not address the use of recovered materials in bristols (e.g., file folders) and coated printing papers.

¹ The 1989 building insulation products procurement guideline and the April 1994 proposed CPG designate several building and construction grade paper products. These designations will be found in the construction products category of the final CPG.

Table 1. — EPA's 1988 Recovered Materials Content Recommendations for Paper and Paper Products.

Item	Minimum percentage of recovered materials	Minimum percentage of postconsumer recovered materials	Minimum percentage of waste paper
Newsprint		40	
High grade bleached printing and writing papers:			
Offset printing			50
Mimeo and duplicator paper			50
Writing (stationery)			50
Office paper (e.g., note pads)			50
Paper for high-speed copiers			*
Envelopes			50
Forms bond including computer paper and carbonless			*
Book papers			50
Bond papers			50
Ledger			50
Cover stock			50
Cotton fiber papers	25		
Tissue products:			
Toilet tissue		20	
Paper towels		40	
Paper napkins		30	
Facial tissue		05	
Doilies		40	
Industrial wipers		0	
Unbleached packaging:			
Corrugated boxes		35	
Fiber boxes		35	
Brown papers (e.g., bags)		05	
Recycled paperboard:			

Item	Minimum percentage of recovered materials	Minimum percentage of postconsumer recovered materials	Minimum percentage of waste paper
Recycled paperboard products including folding cartons		80	
Pad backing		90	

* In 1988, EPA found insufficient production of these papers with recycled content to assure adequate competition. EPA subsequently recommended that procuring agencies use a 50% waste paper standard for these items.

2. Interim Information Requests

Since the 1988 designation of paper and paper products, EPA has monitored the paper industry's use of recovered and postconsumer fiber in manufacturing these items. In 1990, EPA issued a request for comment on options for revising the recommended minimum content levels for printing and writing papers (55 FR 40384, October 3, 1990). Additionally, in 1993, EPA conducted a public forum to discuss options for revising the minimum recovered material content levels for all categories of paper and paper products. EPA also conducted its own research into the use of recovered and postconsumer fiber in the manufacture of paper and paper products. EPA has included a summary of the 1990 public comments and the 1993 public forum in the public docket for the draft RMAN. The research reports are listed in chapter VII of this document and also are available for review in the RCRA docket (Docket F-95-PPRN-FFFFF).²

EPA found that mills have significantly increased their usage of recovered fiber, including postconsumer fiber. According to data compiled by the American Forest & Paper Association (AF&PA), an industry trade association, the use of recovered fiber at domestic paper and paperboard mills increased over 45%, from 19.68 million tons in 1988 to 28.87 million tons in 1993.

The paper industry also increased its ability to use postconsumer and other recovered fiber requiring deinking or other forms of cleaning and processing. According to data published by AF&PA, *Pulp & Paper*, *Paper Recycler*, and others, at least 36 deinked market pulp mills and 30 additional deinking facilities are operational, under construction, or planned for printing and writing paper alone. Additional capacity also is operational, under construction, or planned for newsprint (11 deinking facilities), tissue products (additions to deinking or papermaking at 11 facilities), and paperboard and packaging (additions and expansions at 36 mills).

Additional printing and writing paper products are now available containing postconsumer fiber. Government procuring agencies have been able to purchase printing and writing paper products containing at least 10 percent postconsumer fiber and, in some instances, 15 or 20 percent

² The docket can be found in the RCRA Information Center (RIC), which is located in room M2616, U.S. EPA, 401 M Street, S.W., Washington, DC.

postconsumer fiber. Products such as high-speed copier paper, forms bond, computer paper, carbonless, and coated printing papers now contain both postconsumer and other recovered fiber.

D. Approach to Recovered Materials Content Recommendations

1. One-part vs. Two-part Content Levels

As defined in RCRA section 6002(h), the term "recovered materials" refers to materials generated after the end of the papermaking process. These materials can be generated by many sources, including paper mills, intermediate paper users such as printers and converters, merchants, retailers, or the intended end user. They are sometimes divided into "preconsumer materials," which refers to materials that have not passed through their intended end usage, and "postconsumer materials," which refers to materials that have passed through their intended end usage. In general, procuring agencies can express minimum recycled content standards as a percentage of postconsumer materials content, a percentage of recovered materials (or total recovered materials) content, or percentages of both. For example, today, a common content standard for some printing and writing papers is 50% total recovered materials, including 10% postconsumer materials.

In 1988, EPA recommended postconsumer content levels for newsprint, tissue products, paperboard, and packaging, and "waste paper" content levels for most printing and writing papers. "Waste paper" included postconsumer materials and other specified materials generated after the end of the papermaking process (see 53 FR 23551, June 22, 1988).

In response to the Agency's 1990 request for comment and the 1993 public forum, a group of commenters suggested that EPA recommend two-part content levels consisting of a "total recovered materials" component in addition to a postconsumer recovered materials component. Within this group, some commenters favor a postconsumer materials component defined consistently with the postconsumer definition contained in RCRA section 6002(h). Others favor a broader component consisting of these postconsumer materials plus certain preconsumer materials that require deinking or cleaning, similar to postconsumer materials, prior to use. These commenters argue that two-part content levels can achieve two goals: (1) assure markets for all recovered materials, regardless of source and (2) increase demand for postconsumer materials. Because there is a limited amount of preconsumer recovered materials, some commenters argue that pulp and paper mills will need to use greater percentages of postconsumer materials in order to meet total recovered materials requirements in their products. According to one commenter's estimate, the paper industry recovered and used 87% of available preconsumer materials (i.e., materials generated by sources other than the intended end user of a finished product) in 1990.³ According to AF&PA, almost all preconsumer materials are recovered and used (when exports are taken into account).

³ See the "Final Report on Recycled Paper Definitions, Standards, Measurement, Labeling Guidelines, and Buy-Recycled Initiative," Addendum E, Recycling Advisory Council, February 6, 1992. EPA placed a copy of this report in the docket for the Paper Products RMAN. The report also is available from the National Recycling Coalition.

A second group of commenters favored a single, strictly postconsumer standard. These commenters argue that most preconsumer material is already recovered, and that the focus for government procurement should be on postconsumer paper because it is the single largest component of municipal solid waste. They also believe that only a strictly postconsumer standard will stimulate markets for materials collected by municipal recycling programs.

A third group of commenters argue in favor of a single, total recovered materials standard encompassing both preconsumer and postconsumer materials. They believe that because most preconsumer material is already recovered, virtually all additional recovered paper will necessarily come from postconsumer sources.

EPA believes that the two-part approach is preferable to the postconsumer-only and total recovered materials-only approaches because the two-part approach will result in greater usage of postconsumer materials. A single, postconsumer level fails to acknowledge the continuing contribution to solid waste management and the investments made by mills that have been using all recovered materials, regardless of source, that require deinking, cleaning, or processing prior to use. Additionally, EPA believes that, because most preconsumer materials are now being used, total recovered materials content levels will lead to higher use of postconsumer materials as mills seek sufficient materials to meet the total recovered materials content levels.

EPA also believes that a broad, single, total recovered materials content level will not fulfill the statutory intent to encourage government agencies to procure paper products containing the highest percentage of postconsumer recovered material practicable because it does not provide an incentive to mills to use postconsumer materials in the products marketed to government agencies. In fact, under a single, total recovered materials standard, it would be possible for a mill to meet the standard by manufacturing paper containing only clean materials such as converters scrap and never process postconsumer materials.

2. Broad vs. Narrow Definition of "Postconsumer Materials"

Several groups recommended that EPA broaden the postconsumer definition to include certain preconsumer materials that, like postconsumer materials, require deinking or contaminant removal prior to use. These groups state that there is no reason, from a papermaking perspective, to separate these materials. They further state that it is difficult to distinguish postconsumer and preconsumer materials and that tracking of postconsumer materials is not feasible and extremely costly to implement.

EPA notes that it is not the intent of RCRA that pulp and paper mills track every piece of recovered paper or that mills incur unnecessary costs using recovered fiber. Under RCRA section 6002, procuring agencies are required to (1) obtain certifications that the product offered to them meets the minimum content level and (2) purchase paper products containing the highest levels of postconsumer materials practicable. Procuring agencies are not required to obtain certifications regarding the exact amount of postconsumer or recovered fiber used. For example, if an agency solicits copier paper containing 20% postconsumer fiber, bidders must certify that the product offered contains this minimum percentage. The product may occasionally contain higher levels of

postconsumer fiber, but the bidders and the mills supplying them are not required to conduct a detailed analysis in order to determine the exact percentage of postconsumer fiber in the product.

Some degree of tracking is needed, however, to identify the postconsumer fiber content of paper and paper products offered to government agencies in order to satisfy the statutory certification requirement and to meet the statutory requirement that paper and paper products contain the highest levels of postconsumer materials practicable. Although it is difficult, in some instances, to determine whether a material is pre- or postconsumer, manufacturers of deinked market pulp and paper products containing postconsumer fiber have been able to track postconsumer fiber successfully as part of their normal operations.

EPA notes that, while several groups also urged the adoption of a broader postconsumer definition for use in Executive Order 12873, the Executive Order contains a postconsumer definition analogous to the statutory definition. EPA believes that its recommendations should be consistent with the Executive Order.

As discussed in section I.C above, there have been significant increases in deinking and processing capacity and various technology improvements that make it possible to manufacture virtually all non-food⁴ grades of paper and paperboard using some percentage of postconsumer fiber. Thus, EPA believes that it is not necessary to expand the definition of "postconsumer" used in the 1988 procurement guideline. For these reasons, EPA is using the statutory definition of "postconsumer" in the draft RMAN.

EPA also notes that the type of postconsumer "material" of concern is fiber. For most products, the fiber is derived from wood, but it also can be derived from textiles or agricultural products. The availability of such fiber is limited and has been used primarily by manufacturers of cotton fiber printing and writing papers, which represented less than 1% of printing and writing paper capacity in 1993. Recognizing this, EPA will refer to "postconsumer fiber," rather than to "postconsumer material." EPA believes that the statutory definition is broad enough to encompass postconsumer fiber derived from textiles and other non-wood sources.

Thus, the two-part content levels recommended in the draft RMAN will consist of a "recovered fiber" component and a "postconsumer fiber" component. These terms are discussed in chapter VI.

As part of this approach, EPA will no longer use the term "waste paper" for printing and writing papers. EPA prefers the term "recovered fiber" because the name reflects the fact that this

⁴ Manufacturers of food-grade paper and paperboard must be able to certify that their products meet Food and Drug Administration requirements that the items contain no hazardous and deleterious substances that can migrate into the food. While it is technically possible to produce a food-grade product with recovered and/or postconsumer fiber, the material must be carefully selected. Limited availability of suitable material precludes wide-spread use of recovered or postconsumer fiber in food-grade paper products.

material has value. As discussed in chapter VI, EPA is adapting the 1988 definition of "waste paper" to define "recovered fiber."

3. Establishment of Minimum Recovered Materials Content Levels and Ranges

a. Content recommendations vs. minimum content standards. RCRA section 6002 requires procuring agencies to purchase paper and paper products containing the highest percentages of postconsumer recovered materials practicable. EPA stated in the 1988 paper procurement guideline that the use of minimum content levels would satisfy this requirement (see 53 FR 23553, June 22, 1988).

EPA notes that under RCRA section 6002(i), it is the procuring agencies' responsibility to establish minimum recovered materials content standards, while EPA provides recommendations regarding the levels of recovered materials in the designated items. To make it clear that EPA does not establish the specific minimum content standards used by other agencies, EPA will no longer refer to its recommendations as recovered materials content "standards," as was done in the 1988 paper procurement guideline. Instead, EPA will refer to its recommendations as recovered materials content "levels," consistent with RCRA section 6002(e) and Executive Order 12873.

b. Recommended content ranges. Executive Order 12873 directs EPA to present "the range of recovered materials content levels within which the designated recycled items are currently available." In meeting this provision, EPA will recommend ranges, where possible, that (1) reflect the best information available to the Agency about the use of postconsumer and other recovered fiber in the manufacture of a designated item and (2) encourage manufacturers to use the maximum amount of postconsumer and recovered fiber without compromising competition or product performance and availability. EPA recommends that procuring agencies use these ranges, in conjunction with their own research into the content of items available to them, to establish their minimum content standards. In some instances, EPA will recommend one level, rather than a range, because the item is universally available at that recommended level. In such cases, EPA recommends that procuring agencies use that level in establishing their minimum content standards.

EPA believes that ranges are appropriate for three reasons. First, the Executive Order directs EPA to recommend ranges. Second, while many agencies will continue to purchase paper products centrally (or from the General Services Administration or the Government Printing Office), local purchases will increase as a result of recent procurement reform, which increases the small purchase threshold and allows greater local purchasing using government credit cards. Currently, the postconsumer and total recovered fiber content of many paper products varies, as does product availability, across the U.S. Procuring agencies can use the ranges as an information source in establishing standards for local purchases.

Third, as discussed in section I.A above, although EPA's recommendations are intended for government purchasing agencies and their contractors, the Agency is aware that private sector purchasers refer to EPA's recommendations when purchasing paper products. EPA wants to encourage the continued broad use of its recommendations to foster greater demand for products

containing postconsumer and recovered fiber, which, in turn, will lead to increased usage of these materials.

There currently are insufficient quantities of paper and paper products containing high percentages of postconsumer and recovered fiber to meet the demand of both public and private sector purchasers. By recommending ranges, EPA is acknowledging that some purchasers will be able to buy products that contain higher percentages of postconsumer and recovered fiber, while others will find that products are available that contain lower percentages of these materials. Others, while not being able to buy products that contain postconsumer and recovered fiber even at the low end of the ranges, will continue to seek such products, increasing overall demand for paper products containing recovered fiber. EPA anticipates that this increased demand for and purchase of paper and paper products containing postconsumer and recovered fiber, even at the low end of the recommended ranges, will spur pulp and paper mills to make additional capital investments in the equipment and systems needed to use greater percentages of these fibers.

Therefore, EPA encourages both public and private sector purchasers to establish their minimum content standards at the highest levels practicable; if a product is not available at a content level at the high end of the range, purchasers should set their standards at the highest levels available to them, using the recommended range as a guide. In this way, EPA's recommended ranges will encourage both public and private sector purchasers to purchase paper products containing the highest levels of postconsumer and recovered fiber practicable.

4. EPA's Methodology for Recommending Postconsumer and Recovered Fiber Content Levels

EPA identified and evaluated pertinent data sources and information regarding the percentages of postconsumer and recovered fiber contained in paper and paper products. Sources included EPA research, responses to the 1990 *Federal Register* request for comment and the 1993 public forum, procuring agency and industry data, manufacturers' information, and other published data. Based on this information and the content levels established in Executive Order 12873, EPA established recommended levels or ranges of levels for paper and paper products.

a. Objectives. As discussed in section I.A above, EPA has two objectives: (1) to maximize the use of postconsumer and recovered fiber in paper and paper products and (2) to promote paper recycling by increasing both the usage of postconsumer recovered fiber in paper manufacturing and the availability of competitively-priced paper and paper products containing postconsumer and recovered fiber.

b. Establishing the recommended ranges. Whenever feasible, EPA will recommend ranges for both recovered fiber and postconsumer fiber content. In selecting the ranges, EPA tried to ensure achievement of the statutory objective of maximizing the use of postconsumer materials by ensuring that paper products containing the highest levels of postconsumer and recovered fiber practicable will be available at reasonable prices. This ensures their actual purchase by procuring agencies, thus encouraging maximum use of postconsumer materials.

The high end of each range will be set at the maximum content currently used in paper and paper products that are available in sufficient quantities, and with adequate competition, to meet procuring agency needs. For many items, this level will be 100% for the recovered fiber component of the two-part content recommendations. The high end of each range will direct procuring agencies toward those levels that will meet the statutory requirement to purchase paper and paper products containing the highest levels of postconsumer fiber practicable. Thus, EPA strongly encourages procuring agencies to specify and seek paper and paper products containing both postconsumer and recovered fiber at levels at or near the high end of the recommended ranges.

The low end of each range will be set at levels that can be met by the simple majority of mills currently producing paper and paper products containing postconsumer and recovered fiber. These levels could also be met by other mills if they decide to purchase or produce pulp made from postconsumer and recovered fiber. For most items, these levels will be higher than the lowest percentage currently in use, in order to provide an incentive for paper mills that now primarily use wood-based fiber or lower levels of postconsumer or recovered fiber to increase their use of postconsumer and recovered fiber in the manufacture of their products. For example, if the majority of mills currently use 20% postconsumer fiber in a writing paper, but a few mills use 10% postconsumer fiber, EPA would recommend 20% as the low end of the range.

In all five major paper and paperboard grades, there are groups of mills that use high levels of postconsumer and recovered fiber and groups of mills that primarily use wood-based fiber, sometimes in conjunction with low percentages of postconsumer and/or recovered fiber. EPA has attempted to account for this diversity in establishing the recommended ranges. As a result, for some items, there is a broad range for postconsumer or recovered fiber content. The high end of these ranges generally reflects the percentages of postconsumer and recovered fiber used by mills that rely on this type of fiber, while the low end of the ranges reflects the percentages of postconsumer and recovered fiber used by mills that rely primarily on wood-based fiber. For many items, the low end of the recovered fiber range is the same percentage as the low end of the postconsumer fiber range. In these instances, all of the recovered fiber used by these mills is postconsumer fiber. This means that the item can contain either all postconsumer fiber (e.g., X% recovered fiber, all of which is postconsumer) or blends of recovered and postconsumer fiber (e.g., 100% recovered fiber, including Y% postconsumer fiber) and still fall within EPA's recommended ranges.

EPA believes that as more mills manufacture paper and paper products containing the recommended levels of postconsumer and recovered fiber, paper recycling will increase to meet mills' demand for fiber. EPA also believes that there will be an increase in the availability of paper and paper products containing postconsumer and recovered fiber to meet both public and private sector demand.

It is EPA's intention to provide procuring agencies with the best and most current information available to assist them in fulfilling their statutory obligations under RCRA section 6002. To do this, EPA will monitor changes in manufacturing capacity and product content and the progress made by

procuring agencies in purchasing paper and paper products with the highest percentages of postconsumer and recovered fiber practicable. EPA will periodically adjust the recommended content ranges to reflect these changes. EPA anticipates that over time, the recommended ranges will narrow as the lower end of the ranges are raised.

II. RECOMMENDATIONS FOR NEWSPRINT

"Newsprint" refers to the type of paper generally used in the publication of newspapers. The federal government uses newsprint for printing the *Federal Register*, *Congressional Record*, and similar publications.

Newsprint is made primarily of mechanical wood pulp (also known as groundwood). In 1993, U.S. newsprint mills shipped 7 million tons of newsprint, which represents 8% of domestic paper and paperboard production. Domestic newsprint mills consumed nearly 3 million tons of recovered fiber in 1993.

In the 1988 paper procurement guideline, EPA recommended a content standard of 40% "postconsumer material" for newsprint. Many newsprint mills are not yet using this level of postconsumer fiber. However, EPA found that in the past five years, in response to demand from newspaper publishers, North American newsprint mills invested billions of dollars in equipment to recycle newsprint. At least 35 mills now produce newsprint containing some percentage of postconsumer or recovered fiber. These mills use old newspapers (ONP), old magazines (OMG), and some over-issue publications. According to reports issued by the Newspaper Association of America (NAA) and by the Northeast Recycling Council (NERC), use of postconsumer and recovered fiber has increased significantly at North American newsprint mills but, on average, is still below 40%. NAA estimates that the average amount of recovered fiber in newsprint will be 25% by the end of 1994.

EPA also found that there are two groups of mills manufacturing newsprint: those using 100% recovered fiber, including high percentages of postconsumer fiber, and those using wood-based fiber combined with lower percentages of postconsumer and recovered fiber. The ranges that EPA is recommending today reflect the diversity in postconsumer and recovered fiber use between these two groups of mills. EPA recognizes that while it is technically feasible for all newsprint mills to use postconsumer and recovered fiber, it is not economically feasible at this time for mills that rely primarily on wood-based fiber to substitute high percentages of postconsumer and recovered fiber for their wood-based fiber. EPA also recognizes that newsprint containing 100% recovered fiber is not uniformly available to purchasers throughout the U.S. It is EPA's intent that the ranges will encourage all newsprint mills to use at least some postconsumer fiber, which will increase both availability of "recycled" newsprint and demand for ONP and OMG.

EPA does not have information about the percentages of postconsumer fiber contained in each U.S. newsprint mill's product. NERC provided data about the total recovered fiber content of the newsprint made by 15 U.S. and 8 Canadian mills. Because most of these mills use wood-based fiber and add percentages of postconsumer fiber in order to meet client demand for recycled newsprint, EPA assumed that the recovered fiber percentages in NERC's data actually represent postconsumer fiber usage. The median content level of newsprint made by the 23 mills is 40%. At least seven mills use 40% or more recovered fiber; two of these mills' newsprint contains 40% recovered fiber, and five mills' newsprint contains 50 - 100% recovered fiber. Another seven mills produced newsprint containing 20 - 30% recovered fiber. Only three of the mills produced newsprint containing 10 - 20% recovered fiber.

In addition, five U.S. mills and one Canadian mill produce newsprint containing 100% recovered fiber; their products can contain up to 85% postconsumer fiber. Together, they produce 1.1 million tons of newsprint annually, which represents 9% of total U.S. newsprint production.

Based on this information, EPA is recommending a postconsumer content range from 40 - 85%.

In light of the fact that some newsprint mills use 100% recovered fiber and that the Government Printing Office (GPO) has been able to purchase newsprint containing 100% total recovered fiber, EPA is recommending that newsprint contain 40 - 100% recovered fiber. EPA is setting the low end of the recovered fiber range at 40%, the same level as the low end of the postconsumer range, to reflect the fact that the majority of newsprint mills use postconsumer fiber in conjunction with wood-based fiber. In other words, the low end of the range is 40% recovered fiber, all of which is postconsumer fiber.

In sum, in section A-2 of the draft RMAN, EPA recommends that newsprint contain a range of 40 - 100% recovered fiber and a range of 40 - 85% postconsumer fiber. EPA recommends that both public and private sector purchasers establish their minimum content standards at the highest levels practicable; if a product is not available at a content level at the high end of the postconsumer or recovered fiber ranges, purchasers should set their standards at the highest levels available to them, using the recommended ranges as a guide.

III. RECOMMENDATIONS FOR TISSUE PRODUCTS

A. Background

The tissue sector of the paper industry produces both sanitary tissue products, such as bathroom and facial tissue, towels, and napkins, and specialty products, such as wrapping tissue, waxing tissue, and cellulose wadding. Because U.S. General Services Administration (GSA) data indicate that government agencies purchase sanitary tissue products, not specialty tissue products, EPA's research efforts were limited to this product area. Similarly, EPA's recommendations only cover sanitary tissue products. EPA requests comment on whether government agencies purchase specialty tissue products and, if so, which products they use. EPA also requests information on the use of postconsumer fiber and recovered fiber in the manufacture of specialty tissue products.

In 1993, domestic mills shipped over 5.8 million tons of sanitary tissue products, representing just under 7% of domestic paper and paperboard production. They used 3.6 million tons of recovered fiber.

The sanitary tissue industry has two distinct components -- consumer products (the "at-home" market) sold at the retail level, and commercial/industrial products (the "away-from-home" market). The commercial/industrial segment provides tissue products to industrial and institutional customers, including government agencies. The "at-home" market represents about 70% of sanitary tissue production, while most of the remainder is commercial/industrial tissue.

B. Recovered Fiber Content Levels

In 1991, EPA research indicated that there was a significant difference in the usage of recovered fiber by producers of consumer tissue products and producers of commercial/industrial tissue products. Producers of commercial/industrial tissue products used relatively high percentages of recovered fiber, whereas the use of recovered fiber in consumer products was minimal. EPA's 1994 research showed that recovered fiber usage in consumer products increased substantially, but it was still lower than the percentages used in commercial/industrial tissue products. Given that there are these distinct differences in usage of postconsumer and recovered fiber between the two components of the sanitary tissue industry, EPA concluded that it is appropriate to recommend different content levels for each. As explained in the item-specific subsections below, EPA is recommending different content levels for commercial/industrial tissue products and consumer tissue products, where feasible. EPA lacks sufficient data on consumer paper napkins and consumer facial tissues to recommend content levels for these items. EPA is requesting additional data in order to recommend content levels in the future.

Recent additions of deinking capacity and technical developments that improve product quality are allowing many tissue producers to expand their use of recovered fiber. According to published reports, 32 U.S. mills have the capacity for at least 2.8 million tons per year of tissue containing

recovered fiber, representing 43% of total U.S. capacity.⁵ AF&PA's 1993 capacity survey reports that these mills are expected to use 4.1 million short tons of recovered fiber by 1996.

However, tissue mills and printing and writing paper mills currently compete for the higher quality recovered fiber. As printing and writing paper mills use more of the high grade postconsumer fiber, tissue mills will be required either to pay more for this fiber or to invest in the processing capability to handle lower grades of postconsumer fiber.

Trade publications report that there has been increased usage of postconsumer fiber in both consumer and commercial/industrial tissue products. This fact, combined with the competition between tissue and printing and writing mills for higher grade postconsumer fiber, leads EPA to conclude that it is unlikely that tissue mills will further increase the percentages of postconsumer fiber in their products in the near term.

In considering revisions to the Agency's 1988 content recommendations for tissue products, EPA has concluded that it is important to encourage mills to use postconsumer fiber in their consumer products, as well as in their commercial/industrial tissue products. Because consumer products account for 70% of tissue production, they are a potential market for larger quantities of postconsumer fiber. EPA research indicates that most mills currently producing "recycled" consumer tissue products are using percentages of postconsumer fiber at or around EPA's 1988 recommended content levels. Many of these mills primarily use recovered and postconsumer fiber, rather than wood-based fiber, however.

In 1991, only a few producers of commercial sanitary tissue products claimed that their products contained postconsumer fiber levels meeting EPA's recommended minimum content levels. Today, the majority of mills claim 100% total recycled content, and most manufacture products that meet the 1988 postconsumer content levels. EPA believes that it is appropriate to recognize that tissue mills provide a viable market for both recovered fiber and postconsumer fiber. Therefore, as discussed in the following subsections, EPA is adding recovered fiber recommendations for tissue products.

EPA believes that use of higher percentages of postconsumer and recovered fiber by manufacturers of tissue products will depend on several variables, including the availability of sufficient fiber and expanded papermaking capacity. Should EPA obtain information indicating that mills are able to produce products containing higher levels of postconsumer and recovered fiber at a reasonable price, EPA will revise the ranges upward in the future.

⁵"New recycled tissue products court consumer markets," *Paper Recycler*, Vol. 4, No. 11, November 1993, pg. 7.

C. Bathroom Tissue

In the 1988 paper procurement guideline, EPA recommended a 20% postconsumer content level for toilet tissue (also known as bathroom tissue). At present, there is great variability in usage of postconsumer and other recovered fiber among bathroom tissue producers.

1. Commercial/Industrial Bathroom Tissue Products

EPA's current research reveals that manufacturers of commercial/industrial bathroom tissue can be grouped by their usage of postconsumer fiber. Eight of the 16 mills for which EPA has data are producing bathroom tissue for the commercial/industrial market containing a minimum of 20% postconsumer fiber. Three of these 16 mills use a minimum of 25% postconsumer fiber, and one uses 22% postconsumer fiber. Another mill uses slightly higher percentages of postconsumer materials (35%). Of the producers supplying the federal government, three mills are able to use 60% or more postconsumer fiber. Since at least five mills can meet a minimum of 25% postconsumer fiber and another four mills could meet this minimum by increasing their postconsumer content slightly, EPA recommends 25% as the low end of the postconsumer fiber range for commercial/industrial bathroom tissue. EPA recommends 60% as the high end of the postconsumer fiber range for this item.

In addition to postconsumer fiber, almost all manufacturers of commercial lines of bathroom tissue use 100% recovered fiber. Therefore, EPA is recommending that commercial/industrial bathroom tissue products contain 100% recovered fiber.

In sum, in section A-3 of the draft RMAN, EPA is recommending two-part content levels for commercial/industrial bathroom tissue products. For the postconsumer fiber component, EPA recommends a range of 25 - 60%, and for the recovered fiber component, EPA recommends a content level of 100%. EPA further recommends that procuring agencies continue to seek and purchase products at the high end of the postconsumer range for their purchases.

2. Consumer Bathroom Tissue Products

Three of the largest producers of consumer bathroom tissue products use no or low levels (20% or less) of postconsumer fiber. These mills produce tissue products primarily from wood pulp. In order to encourage greater use of postconsumer fiber by all producers of consumer bathroom tissue products, EPA is recommending 20% postconsumer fiber as the low end of the postconsumer range for these products. In addition, three other mills that currently produce consumer bathroom tissue products using primarily recovered fiber, are able to use 60% or more postconsumer fiber. Based on this information, EPA is recommending 60% postconsumer fiber as the high end of the range for consumer bathroom tissue products.

Consumer tissue products can contain 100% recovered fiber, depending on the product and the manufacturer. Some mills only use low levels of recovered fiber, all of which is postconsumer fiber, while others use 100% recovered fiber, including postconsumer fiber. Based on this information, and considering that 20% is the low end of the recommended postconsumer range, EPA

recommends a range of 20 - 100% for the recovered fiber content of consumer bathroom tissue products. Using this range, EPA expects that some mills will produce consumer bathroom tissue containing 20% recovered fiber, all of which is postconsumer fiber, while other mills will produce consumer bathroom tissue containing as much as 100% recovered fiber, including percentages of postconsumer fiber. EPA encourages all manufacturers of consumer bathroom tissue products to use postconsumer fiber meeting EPA's recommendations and to seek ways to increase recovered fiber usage in their products.

D. Paper Towels

In the 1988 paper procurement guideline, EPA recommended a 40% postconsumer content level for paper towels. Currently, there is great variability in usage of postconsumer and recovered fiber among paper towel producers.

1. Commercial/Industrial Paper Towels

EPA's current research reveals that manufacturers of commercial/industrial paper towels can be grouped by their usage of postconsumer fiber. Eleven of the 19 mills for which EPA has data are producing paper towels for the commercial/industrial market containing a minimum of 40% postconsumer fiber. A twelfth mill is using a slightly lower level (35%). Five of the 19 mills are able to use 60% or more postconsumer fiber. Since at least 11 mills can meet a minimum of 40% postconsumer fiber and another mill could meet this minimum by increasing its postconsumer content slightly, EPA recommends 40% as the low end of the postconsumer fiber range for commercial/industrial paper towels. EPA recommends 60% as the high end of the postconsumer fiber range for this item.

Most mills manufacture commercial/industrial paper towels containing 100% recovered fiber. For this reason, EPA recommends that this item contain 100% recovered fiber.

In sum, in section A-3 of the draft RMAN, EPA is recommending two-part content levels for paper towels. For the postconsumer fiber component, EPA recommends a range from 40 - 60%, and for the recovered fiber component, EPA recommends a content level 100%. EPA further recommends that procuring agencies continue to use the high end of the postconsumer fiber range for their purchases.

2. Consumer Paper Towels

EPA knows of only one large producer of consumer paper towels that is using postconsumer fiber (at a 10 - 20% content level), although a second large manufacturer is testing a line of "recycled" paper towels. These mills produce paper towels primarily from wood pulp. In order to encourage greater use of postconsumer fiber by all producers of consumer paper towels, EPA is recommending 20% postconsumer fiber as the low end of the postconsumer range for these products. In addition, two other mills that currently produce consumer paper towels using primarily recovered fiber, are able to use 60% or more postconsumer fiber. Based on this information, EPA recommends 60% postconsumer fiber as the high end of the range for consumer paper towels.

Consumer paper towels can contain 100% recovered fiber, depending on the product and the manufacturer. Some mills will only use low levels of recovered fiber, all of which is postconsumer fiber, while others will use 100% recovered fiber, including percentages of postconsumer fiber. In fact, six mills currently produce consumer paper towels using 100% recovered fiber (or, in the case of one mill, 70 - 100% recovered fiber). Based on this information, and considering that 20% is the low end of the recommended postconsumer range, EPA recommends a range of 20 - 100% for the recovered fiber content of consumer paper towels. Using this range, EPA expects that some mills will produce consumer paper towels containing 20% recovered fiber, all of which is postconsumer fiber, while other mills will produce consumer paper towels containing as much as 100% recovered fiber, including percentages of postconsumer fiber. EPA encourages all manufacturers of consumer paper towels to use postconsumer fiber meeting EPA's recommendations and to seek ways to increase recovered fiber usage in their products.

E. Paper Napkins

In the 1988 paper procurement guideline, EPA recommended a 30% postconsumer content level for paper napkins. As with the other tissue products, there is great variability in usage of postconsumer and recovered fiber among paper napkin producers.

1. Commercial/Industrial Paper Napkins

EPA's current research reveals that manufacturers of paper napkins for the commercial/industrial market can be grouped by their usage of postconsumer fiber. Three of the 10 mills for which EPA has data are producing paper napkins containing a minimum of 30% postconsumer fiber. A fourth mill uses slightly less postconsumer fiber (20 - 30%), and a fifth mill uses slightly higher percentages of postconsumer fiber (35%). At least three of the ten mills are able to use 60% or more postconsumer fiber. Since at least four mills can meet a minimum of 30% postconsumer fiber and another mill could meet this minimum by increasing its postconsumer content slightly, EPA recommends 30% as the low end of the postconsumer fiber range for commercial/industrial paper napkins. EPA recommends 60% as the high end of the postconsumer fiber range for this item.

All but two manufacturers of paper napkins for which EPA has data are using 100% recovered fiber. One of the two mills uses at least 40%, and the other mill uses at least 50% recovered fiber. Because most of mills manufacture commercial/industrial paper towels containing 100% recovered fiber, EPA recommends that this item contain 100% recovered fiber.

In sum, in section A-3 of the draft RMAN, EPA is recommending two-part content levels for paper napkins. For the postconsumer fiber component, EPA recommends a range of 30 - 60%, and for the recovered fiber component, EPA recommends a range of 30 - 100%. EPA further recommends that procuring agencies continue to use the high end of the postconsumer fiber range for their purchases.

2. Consumer Paper Napkins

EPA's data on use of postconsumer fiber in consumer paper napkins is limited. The Agency has data on four mills that produce consumer paper napkins primarily from recovered and postconsumer fiber, but lacks data about the use of postconsumer and recovered fiber by consumer napkin manufacturers that primarily use wood pulp. EPA believes that the introduction of additional "recycled" consumer paper napkins will follow the same pattern as the other tissue products made primarily from wood-based fiber: manufacturers of these products can be expected to use only low levels of postconsumer fiber. In order to encourage greater use of postconsumer fiber by all producers of consumer paper napkins, EPA is considering setting the low end of the postconsumer range for consumer paper napkins at 30% postconsumer fiber, which is the low end of the range recommended for commercial/industrial paper napkins. EPA requests comment on whether manufacturers that primarily use wood-based fiber can produce consumer paper napkins containing this level of postconsumer fiber.

One of the four mills for which EPA has data currently produces consumer paper napkins containing 60% postconsumer fiber; the other three mills use no or lower levels of postconsumer fiber. Based on this limited information, EPA is considering recommending 60% postconsumer fiber as the high end of the postconsumer range for consumer paper napkins. EPA requests comment on this content level.

Consumer paper napkins can contain 100% recovered fiber, depending on the product and the manufacturer. EPA expects that some mills will only use low levels of recovered fiber, all of which is postconsumer fiber, while others will use 100% recovered fiber, including percentages of postconsumer fiber. In fact, three mills currently produce consumer paper towels using 100% recovered fiber (and a fourth mill uses up to 100% recovered fiber). Based on this information, and considering that 30% is the low end of the recommended range for commercial/industrial paper napkins, EPA is considering recommending 30% as the low end of the recovered fiber range for consumer paper napkins as well. Further, EPA is considering recommending 100% as the high end of the recovered fiber range for consumer paper napkins. EPA requests comment on this range for consumer paper napkins.

F. Facial Tissues

EPA's 1988 recommendation for facial tissue was 5% postconsumer fiber, reflecting the limited use of postconsumer fiber in this item. As discussed below, facial tissue is available containing higher levels of postconsumer fiber, as well as recovered fiber.

1. Commercial/Industrial Facial Tissues

Today, facial tissue is available at postconsumer content levels as high as 100%. One of the five mills for which EPA has data uses 30% postconsumer fiber, while two other mills use less (20%) or slightly more (up to 35%). A fourth mill uses up to 100% postconsumer fiber. Since three mills can meet a 30% content level, and the fourth mill can meet it by increasing its percentage of

postconsumer fiber slightly, EPA is recommending a 30% postconsumer fiber content level for commercial/industrial facial tissues.

Three of the five manufacturers for which EPA has information use 100% recovered fiber in facial tissue for the commercial/industrial market, and a fourth mill uses up to 100% recovered fiber. For this reason, EPA recommends that this item contain 100% recovered fiber.

In sum, in section A-3 of the draft RMAN, EPA is recommending two-part content levels for facial tissue products. For the postconsumer fiber component, EPA recommends a content level of 30%, and for the recovered fiber component, EPA recommends a content level of 100%.

2. Consumer Facial Tissues

As with consumer paper napkins, EPA's data on use of postconsumer fiber in consumer facial tissues is limited. The Agency has data on four mills that produce consumer paper napkins primarily from postconsumer and other recovered fiber. One of these four mills uses a minimum of 20% postconsumer fiber. A second mill uses higher levels (30 - 45%). A third mill uses almost no postconsumer fiber (up to 3%). The fourth mill uses 100% postconsumer fiber.

EPA lacks data about the use of postconsumer fiber by manufacturers that primarily use fiber derived from wood to produce facial tissues. EPA is not aware of any major manufacturers of consumer facial tissue using postconsumer fiber. EPA believes that the introduction of "recycled" consumer facial tissues by these manufacturers will follow the same pattern as the other tissue products made primarily from wood-based fiber: manufacturers of these products can be expected to use only low levels of postconsumer fiber. In order to encourage greater use of postconsumer fiber by all producers of consumer facial tissues, EPA is considering recommending a 20% postconsumer content level for this item. Three of the four mills currently producing consumer facial tissues from recovered and postconsumer fiber can meet this content level. EPA requests comment on whether manufacturers that primarily use wood-based fiber can produce consumer facial tissues containing this level of postconsumer fiber.

Consumer facial tissues can contain 100% recovered fiber, depending on the product and the manufacturer. EPA expects that some mills will only use low levels of recovered fiber, all of which is postconsumer fiber, while others will use 100% recovered fiber, including percentages of postconsumer fiber. In fact, two mills currently produce consumer facial tissues using 100% recovered fiber (and two other mills use up to 100% recovered fiber). Based on this information, EPA is considering recommending a range of 20 - 100% recovered fiber for consumer facial tissues. EPA requests comment on this range.

G. Industrial Wipers

EPA did not recommend postconsumer or other recovered fiber content levels for industrial wipers in the 1988 paper procurement guideline. EPA research indicated that this product was not available containing postconsumer or recovered fiber at that time.

Industrial wipers are a type of lint-free, absorbent paper towel used to wipe up water, industrial oils, and other liquids. Paper-based wipers are produced on standard paper machines and now can be made with recovered fiber. There also are other types of "high tech" wipers that are manufactured with virgin spun-woven materials which often are held together by a polymer binding or other chemical treatment. Wipers represent a very small percentage of total tissue production.

GSA maintains over 30 Commercial Item Descriptions (CIDs) for wipers. These CIDs describe the end-use and related functional performance requirements of the product and do not specify material. Bidders offer products made from various functionally equivalent materials, including recovered paper, synthetics, textiles, and blends of these materials.

At least one GSA vendor offers a wiper containing 100% total recovered fiber, including 33% postconsumer recovered fiber. Of the other three known wiper manufacturers, one uses 100% recovered fiber, including 10 - 95% postconsumer fiber; another uses 75% recovered fiber, including 40% postconsumer fiber; and the third uses 10 - 50% recovered fiber including 10 - 40% postconsumer fiber. Thus, three manufacturers can produce wipers containing 40 - 100% total recovered fiber, including 40% postconsumer fiber. The fourth mill could meet a 40% postconsumer content level by slightly increasing its use of postconsumer fiber.

Based on this information, EPA recommends recovered fiber ranges of 40 - 100%, including 40% postconsumer fiber. EPA encourages procuring agencies to use the high end of the range when purchasing industrial wipers.

H. Doilies

The term *doilies*, as used in the 1988 paper procurement guideline, referred to placemats used to line food trays, rather than to the die-cut doilies used as a decorative food service liner for items such as pastries and hors d'oeuvres. EPA has learned that placemats or tray covers are manufactured from printing and writing papers, such as tablet paper, rather than from tissue papers. Based on this information, EPA is removing "doilies" from the sanitary tissue products category and listing "tray liners" in a new Miscellaneous Paper Products category, which is found in section A-5 of the draft RMAN.

EPA is aware that McDonald's Corporation is purchasing tray liners containing 100% recovered materials, including 75% postconsumer materials. Based on this information, in section A-5 of the draft RMAN, EPA recommends a content level of 100% recovered fiber, including 75% postconsumer fiber. EPA requests information about the availability of tray liners containing other percentages of recovered fiber, including postconsumer fiber.

In the past, GSA has expressed concern that the use of postconsumer fiber could violate Food and Drug Administration (FDA) restrictions on migration of contaminants into food. McDonald's indicated to EPA that use of postconsumer or other recovered fiber is not a concern with tray liners. EPA requests comment on this issue.

I. Summary of Tissue Products Recommendations

Table 2 lists the revised recommended content levels for tissue products.

Table 2. -- Recommendations for Tissue Products

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
Bathroom tissue Commercial/industrial Consumer	100 20 - 100	25 - 60 20 - 60
Paper towels Commercial/industrial Consumer	100 20 - 100	40 - 60 20 - 60
Paper napkins Commercial/industrial	100	30 - 60
Facial tissue Commercial/industrial	100	30
Industrial wipers	40 - 100	40

J. Summary of Request for Comments on Recommendations for Tissue Products

EPA requests comment on each content level recommendation for tissue products discussed in this chapter. In this chapter, EPA also requested comment or information on the following issues:

- Do government agencies or their contractors purchase specialty tissue products?
- Is postconsumer or other recovered fiber used in the manufacture of specialty tissue products and, if so, in what percentages?
- Can manufacturers of consumer paper napkins and consumer facial tissues that primarily use wood-based fiber produce these items using a minimum of 30% and 20% postconsumer fiber, respectively? If not, what levels of postconsumer fiber can be used in these items?
- Can manufacturers of consumer paper napkins and consumer facial tissues use a range of recovered fiber from 30 - 100% and 20 - 100%, respectively?
- Are tray liners available containing percentages of recovered fiber, including postconsumer fiber, other than 100% recovered fiber, including 75% postconsumer fiber?

- Can postconsumer fiber be used in tray liners and meet Food and Drug Administration (FDA) restrictions on migration of contaminants into food?

IV. RECOMMENDATIONS FOR PAPERBOARD AND PACKAGING

A. Background

Paperboard is a major segment of the paper industry and a major consumer of recovered fiber. In 1993, U.S. mills produced 43.2 million tons of paperboard, nearly 51% of total paper and paperboard production. They used 18.4 million tons of recovered fiber.

The paperboard segment encompasses both packaging and products made from paperboard (e.g., notebook binders). In the 1988 paper procurement guideline, EPA provided content recommendations for paperboard and packaging under two categories, "Unbleached Packaging" and "Recycled Paperboard." The unbleached packaging category included corrugated boxes, fiber boxes, and brown papers (e.g., bags), while the recycled paperboard category included folding cartons and pad backing.

Subsequent EPA research, and information submitted by various groups, indicates that the categories and item listings used in the 1988 procurement guideline do not accurately reflect the widely accepted groupings of paperboard and packaging grades used by paper purchasers and the paper industry. For example, within the paper industry, the paperboard segment includes containerboard, which, in turn, includes the components used to make corrugated containers (linerboard and corrugating medium). Because corrugated boxes are listed under "Unbleached Packaging" in the 1988 guideline, however, EPA has received inquiries about which standard applies -- the 35% postconsumer minimum for corrugated boxes or the 80% postconsumer minimum for recycled paperboard, which could apply to the linerboard component of corrugated boxes.

Additionally, others have suggested that the recommended 80% postconsumer minimum content standard for recycled paperboard is too high and does not reflect industry's ability to incorporate postconsumer fiber into this product.

AF&PA statistics list three subgroupings of paperboard: containerboard, boxboard, and all other. "Containerboard" includes linerboard and corrugating material used in corrugated containers. "Boxboard" includes folding cartons (e.g., cereal boxes), set-up boxes (e.g., shoe boxes), and milk cartons and items used in food service. "All other" includes anything from tubes and cores to specialty boards used in games, book covers, and lottery tickets.

Another problem with the 1988 guideline is that it lists "recycled paperboard" as a distinct category, rather than as a subcategory of paperboard and packaging. By contrast, within the paperboard segment of the paper industry, "recycled paperboard" refers to a particular type of paperboard that can be used in the manufacture of several products. In fact, corrugating material, linerboard, and folding cartons can be made at mills using only fiber from recovered materials (i.e., "recycled paperboard"), at mills using only fiber from wood, and at mills that use a combination of fiber from wood and fiber from recovered materials. This has led to confusion about the applicability of the 1988 "recycled paperboard" content recommendations to products manufactured from paperboard containing fiber derived from wood.

B. Reorganization of Paperboard and Packaging Recommendations

In the draft RMAN, EPA is combining recommendations for paperboard and most packaging into one category, which is entitled "Paperboard and Packaging." Within this category, EPA is retaining an unbleached packaging subcategory for brown paper products. Reflecting the groupings used by paperboard manufacturers, the Paperboard and Packaging category also contains the following additional five subcategories:

- Corrugated containers and solid fiber boxes
- Folding cartons
- Industrial paperboard (e.g., tubes, cores, drums, and cans)
- Miscellaneous board products (e.g., pad backs, book covers, mailing tubes, protective packaging)
- Carrierboard

The Paperboard and Packaging category does not include most bristols, which are thicker papers used for such items as filing and indexing products and greeting cards. Thicker bristols such as railroad board fall within the paperboard category however. As will be explained in chapter V of this document, bristols can be considered to be either paperboard products or printing and writing paper products, depending on their thickness. In the draft RMAN, recommendations for most bristols are found under printing and writing paper because these items have characteristics that are more like paper products than paperboard products in use, function, and aesthetics. In addition, this distinction is consistent with paper industry practice; mills manufacturing bristols generally are considered to be printing and writing paper mills, not paperboard mills.

C. Use of Recovered Fiber in the Manufacture of Paperboard

Paperboard is a thicker, stiffer type of paper product. It can have a single ply structure or a multi-ply structure. Multi-ply boards, which typically contain recovered fiber, are used in the manufacture of folding cartons, rigid boxes, and similar products. In a multi-ply product, the top and bottom layers, or liners, contribute strength and, in the case of the top liner, printability. Therefore, the top and bottom layers are usually made from recovered fibers that are cleaner and retain their fiber strength. Currently, these are most often made from preconsumer fiber but, increasingly, they are being made from postconsumer fiber as well.

The inner, or filler plies, provide thickness to increase the stiffness of the board. Because these plies are not visible, they can be made from lower grade fibers, such as printed postconsumer fibers, that can be darker or dirtier in appearance. The grades usually used for the filler plies are ONP, mixed paper, old corrugated containers (OCC), and used brown kraft bags.

D. Corrugated Containers and Solid Fiber Boxes

The paper industry uses the term "containerboard" to describe paperboard used to make corrugated containers and solid fiber shipping boxes. EPA's 1991 research indicated that containerboard was made primarily from virgin fiber. This has begun to change as production

capacity for making both linerboard and corrugated medium from recovered fiber is increasing. In 1991, recycled containerboard accounted for 11% of production: 2.7 million tons out of total containerboard production of 24.4 million tons. Two years later, in 1993, recycled containerboard accounted for 15% of production: 4.0 million tons out of a total of 26.4 million tons. The recycled containerboard mills used 4.6 million tons of recovered fiber in 1993.⁶ AF&PA projects that containerboard producers will increase their use of recovered fiber -- predominantly postconsumer fiber -- by more than 50% by the year 2000.⁷

1. Corrugated Containers

a. Postconsumer and recovered fiber recommendations. In the 1988 paper procurement guideline, EPA recommended a 35% postconsumer fiber content level for corrugated boxes. Based on product availability, GSA specifies 40% postconsumer fiber for corrugated containers with burst strengths up to 300 pounds per square inch (psi), which is the predominant type of corrugated container that the agency purchases. GSA found that stronger boxes (with bursting strengths exceeding 300 psi) are not available with this level of postconsumer fiber, but are available containing 30% postconsumer fiber.

Because corrugated containers are a composite product, postconsumer and recovered fiber content must be calculated from the content of each component. The calculation method is discussed in the following subsection and Appendix A-1 to the draft RMAN. EPA used this method to calculate fiber content using the fiber percentages currently available in corrugating medium and linerboard. The majority of corrugating medium manufacturers providing information to EPA indicated that they used postconsumer fiber content of 90% or higher. More than half of the linerboard producers contacted indicated that they used postconsumer fiber content of 35% or less. Calculating the postconsumer content of a corrugated container that is made with medium and linerboard meeting the 90% and 35% content levels, respectively, EPA concludes that the high end of the range of postconsumer content levels for corrugated containers can be set at 50% postconsumer fiber.

In section A-4 of the draft RMAN, EPA is recommending content ranges of 40% - 50% postconsumer fiber for corrugated containers rated at less than 300 psi, and a level of 30% postconsumer fiber for containers rated at 300 psi. These recommended content levels are based on the results of EPA's calculation of maximum fiber content and the information supplied by GSA.

While EPA has data on the total recovered fiber content of the components of corrugated containers, the Agency does not have data on the recovered fiber content, other than postconsumer fiber, of the assembled corrugated containers. Therefore, in the draft RMAN, EPA is recommending that the recovered fiber consist entirely of postconsumer fiber. In EPA's table of recommendations,

⁶ There is a difference between the volume of fiber used and the volume of containerboard produced because some fiber is lost during the manufacturing process.

⁷ "The Outlook for Paper Recovery to the Year 2000," prepared for AF&PA by Franklin Associates, Ltd., November 1993.

the content level for corrugated containers rated at less than 300 psi is displayed as 40 - 50% recovered fiber and 40 - 50% postconsumer fiber. This means that the total recovered fiber content of these corrugated containers should be 40 - 50%, all of which is postconsumer fiber. Similarly, the recommended content level for corrugated containers rated at 300 psi is displayed as 30% recovered fiber and 30% postconsumer fiber, meaning that all of the recovered fiber used should be postconsumer fiber. EPA requests information on the use of recovered fiber other than postconsumer fiber in the manufacture of corrugated containers. EPA also requests information on the availability of stronger containers (rated at 300 psi or greater) containing more than 30% postconsumer fiber.

EPA notes that OCC comprises one of the largest recovered materials grades used in corrugated containers. In 1993, OCC was recovered at a rate of 62%. AF&PA projects that between 1992 and the year 2000, linerboard mills will increase OCC consumption by over 25%. At the same time, recycled paperboard mills will increase use of OCC by over 40%. In addition, 12 mini-mills that produce 100% recycled linerboard and corrugating medium are expected to start-up in 1995, and several existing mills are retrofitting equipment to use greater amounts of OCC. With this imminent significant increase in new capacity, there has been speculation in the trade press that shortages of OCC could result.

In fact, there was a shortage of OCC during the summer of 1994, which drove up fiber and manufacturing costs. While mills can substitute some ONP and mixed paper for OCC, the use of these other recovered materials is limited because they do not provide the same strength properties as does OCC. In addition, shortages of ONP for use by newsprint mills is reported in some parts of the U.S., limiting the amount of this recovered material available for use in paperboard products.

EPA does not have information indicating that the recent shortages of OCC have impacted the availability of corrugated containers containing 40 - 50% postconsumer fiber. EPA requests comment regarding the impact on the recommended content levels for corrugated containers of (1) the increased demand for OCC and (2) the imminent additional capacity to make linerboard containing 100% recovered fiber.

b. Method for calculating fiber content. Corrugated containers are made by sandwiching fluted corrugating medium between two layers of linerboard. Because corrugated containers are a composite, recovered fiber content must be calculated from the content of each component relative to the weight each contributes to the total weight of the container. There are many corrugated board combinations, four basic flute sizes used in corrugating medium, and a number of paper weights that must be considered when making an estimate of the recovered material content of the finished product.

Appendix A-1 to the draft RMAN provides an example calculation for how to determine the recovered material content of corrugated containers. The variables used in this example result in a corrugated container which meets and, in fact, slightly exceeds, a 35% postconsumer content level. The example uses data for the most commonly manufactured box, 200 psi test, C-flute made with 42 lb/thousand square feet (MSF) linerboard and 26 lb/MSF medium.

2. Solid Fiber Boxes

Solid fiber boxes are made by laminating several plies of paperboard together. The outer plies are usually linerboard made from wood pulp, while the inner plies may contain either a wood-based fiber linerboard or a high bulk filler board (chipboard), which is made from recovered fiber. The laminated structure is highly resistant to puncture and is durable and strong. Solid fiber boxes are used for specialized packaging needs, such as army ration boxes, dynamite packaging, and for packaging hard, dense items such as machine parts and hardware.

In the 1988 paper procurement guideline, EPA recommended a 35% postconsumer content level for fiber boxes. Based on product availability, GSA uses the same 40% postconsumer fiber standard for solid fiber boxes as it uses for corrugated containers. EPA has no other information about the recovered fiber or postconsumer fiber content of this item.

In section A-4 of the draft RMAN, EPA recommends a content level of 40% recovered fiber, all of which is postconsumer fiber, for solid fiber boxes. This level is based on the information provided by GSA. In EPA's table of recommendations, this recommendation is displayed as 40% recovered fiber and 40% postconsumer fiber.

E. Folding Cartons

In the 1988 paper procurement guideline, EPA recommended an 80% postconsumer content level for "recycled paperboard products including folding cartons." This recommendation raised two issues. First, as discussed above in the Background section, folding cartons can be made from recycled paperboard or from other types of paperboard, so the recommendation did not address all types of folding cartons. Second, the other types of paperboard are made primarily from fiber derived from wood, rather than fiber derived from recovered materials. As with printing and writing paper mills and some tissue mills, it is not economically viable for paperboard mills dependent on wood for their fiber to use high percentages of postconsumer fiber. Some of these mills have begun to use low percentages of postconsumer fiber, however.

The paperboard segment of the paper industry considers folding cartons to be a subset of boxboard. Folding cartons can be clay coated, white lined, and plain. There are differences in the production of coated and uncoated paperboard which might impact the type of recovered fiber used. The coating operation is similar to that used for coated printing papers, and similar problems can be created by contaminants in fiber derived from postconsumer materials.⁸ For this reason, the top ply of coated cartons is usually made from virgin or preconsumer fiber, which generally is longer, stronger, and cleaner fiber, than postconsumer fiber. Inner or "filler" plies can be made from lower grade, postconsumer fibers.

Manufacturers of coated folding cartons use varying percentages of postconsumer fiber, depending on customer specifications. Of the ten manufacturers of folding cartons for which EPA has

⁸ Coated printing papers are discussed in section V.C.

data, two companies use 35% or more postconsumer fiber, while six use 40% or more postconsumer fiber. Half of the mills reported that the high end of their range of postconsumer fiber content is 80% (or higher).

Manufacturers of uncoated folding cartons also use varying percentages of postconsumer fiber, depending on customer specifications. EPA's 1991 research indicated that uncoated folding cartons were available containing 60% postconsumer fiber. EPA has more recent data from only one mill, which uses 45 - 50% postconsumer fiber. Based on EPA's 1991 finding that it is easier to use higher percentages of postconsumer fiber in uncoated folding cartons than in coated cartons, EPA believes that, like coated carton manufacturers, uncoated carton manufacturers should be technically able to use up to 80% postconsumer fiber.

Finally, EPA notes that, in 1992, many major packaged goods producers started claiming an average minimum content of 35% postconsumer fiber in paperboard packaging. Based on product availability, however, GSA specifies a 40% postconsumer content standard for folding cartons. The EPA research discussed above indicates that six of the coated folding carton manufacturers and the one uncoated carton manufacturer can meet a 40% postconsumer fiber content level.

All of the folding carton mills for which EPA has data use 100% recovered fiber in their products. Based on this data and the information discussed above, in section A-4 of the draft RMAN, EPA is recommending content levels for folding cartons of 100% recovered fiber, including 40 - 80% postconsumer fiber.

EPA notes that its 1991 research suggested that there should be different postconsumer content recommendations for coated and uncoated folding cartons because there were significant differences in the type and quantities of recovered fiber used. More recent EPA research and correspondence from paper industry sources suggests that there should be no distinction between coated and uncoated folding cartons for purposes of postconsumer and recovered fiber content levels. EPA requests additional information about differences in postconsumer fiber content, if any, currently used in coated and uncoated folding cartons.

Further, EPA notes that manufacturers of the paperboard used in folding cartons recover fiber from OCC. As discussed in the corrugated container section above, there was a short supply of OCC during the summer of 1994, which drove up fiber and manufacturing costs. EPA does not have information indicating that the OCC shortages affected the availability of folding cartons containing higher levels of postconsumer fiber. EPA requests comment on the impact of the increased demand for OCC on the availability of folding cartons containing higher percentages of postconsumer fiber.

F. Industrial Paperboard

EPA did not recommend content levels for industrial paperboard products in the 1988 paper procurement guideline. Because these items can contain high levels of both recovered and postconsumer fiber, EPA received inquiries about whether the content level for these items should be the 80% postconsumer level recommended for recycled paperboard or some other level.

Products made from industrial paperboard include tubes, cores, cans, and drums. End uses for these products range from very lightweight cores for rolls of bathroom tissue to extremely dense industrial cores, canisters, and drums.

EPA's data and correspondence from industry sources indicate that there can be hundreds of applications for industrial paperboard products, requiring wide variability in the type of fiber used for different end uses. Of the four manufacturers for which EPA has data, one manufacturer reported postconsumer content levels ranging from 90 - 100%. A second manufacturer did not provide its postconsumer percentages. A third manufacturer reported using 69% postconsumer fiber. The fourth producer indicated that the postconsumer content of its drums ranged from 45 - 100%. All use 100% recovered fiber in their products.

In section A-4 of the draft RMAN, EPA is recommending content levels of 100% recovered fiber, including 45 - 100% postconsumer fiber, for the industrial paperboard products subcategory. Because the Agency's information is limited, EPA requests comment on whether there should be different content recommendations based on the specific application(s) of the various industrial paperboard products.

G. Miscellaneous Paperboard Products

There are various miscellaneous paperboard products, including pad backings, book covers, covered binders containing chipboard, mailing tubes, and protective packaging such as video cassette sleeves. There also are a variety of consumer items, such as game boards and puzzles. In the 1988 paper procurement guideline, EPA recommended a 90% postconsumer content level for pad backing, but did not address other miscellaneous paperboard products. EPA has since learned that many of these products are purchased by government agencies and can contain high levels of postconsumer fiber.

The miscellaneous paperboard products are composed of multiple plies. They also can be coated or uncoated, depending on their use. EPA's 1991 research indicated that coated products typically contained a minimum of 45% postconsumer fiber, while uncoated products typically contained a minimum of 60% postconsumer fiber. EPA's 1994 research provides insufficient data to distinguish separate postconsumer fiber content levels for coated and uncoated products. It includes information from only two of the ten manufacturers of the paperboards used in miscellaneous products. One manufacturer can use up to 100% postconsumer fiber, while the other manufacturer uses 75 - 100% postconsumer fiber. As with other paperboard products, the percentage of postconsumer fiber depends on the product and customer specifications.

In 1991, coated and uncoated miscellaneous paperboard products contained 90 - 100% total recovered fiber. Both manufacturers for which EPA has current data use 100% recovered fiber.

In section A-4 of the draft RMAN, EPA is recommending a content level of 100% recovered fiber, including 75 - 100% postconsumer fiber for both coated and uncoated miscellaneous paperboard products. EPA requests comment on whether there should be different postconsumer ranges for

coated and uncoated miscellaneous paperboard products and whether there should be different content recommendations based on the specific application(s) of the products.

H. Unbleached Packaging

In the 1988 paper procurement guideline, EPA recommended a 5% postconsumer content level for brown papers. At that time, little postconsumer fiber was used in brown papers, which are used for products such as wrapping paper and bags.

Currently, some manufacturers are producing bags containing more than 5% postconsumer fiber. At least one grocery sack manufacturer uses up to 20% ONP. GSA informed EPA that 20% is a feasible content level from a performance perspective. GSA has not been able to purchase grocery sacks containing 20% postconsumer fiber at this time, but has been able to purchase sacks containing 5% postconsumer fiber. Based on this information, EPA recommends that unbleached packaging contain 5 - 20% postconsumer fiber.

EPA has insufficient data on which to base recommended ranges for recovered fiber content. Research conducted by other organizations and submitted to EPA suggests that 40% recovered fiber can be used in unbleached packaging. Based on the availability information provided by GSA, EPA concludes that some manufacturers of unbleached packaging will use only low levels of recovered fiber, all of which is postconsumer fiber. For this reason, EPA is recommending a recovered fiber content range of 5 - 40% for unbleached packaging.

In sum, in section A-4 of the draft RMAN, EPA is recommending a content range of 5 - 40% recovered fiber, and a postconsumer fiber range of 5 - 20% for unbleached packaging.

I. Padded Mailers

In the 1988 paper procurement guideline, EPA included padded mailers with envelopes. EPA recommended a 50% waste paper content level for all envelopes.

EPA has since learned that padded mailers are not considered to be "envelopes" by either GSA or the envelope sector of the paper industry. Instead, they are considered to be packaging materials. For this reason, EPA is including padded mailers with other packaging items in the draft RMAN.

Padded mailers must be strong and durable to protect the items shipped in them. Therefore, padded mailers are made from kraft paper, which contains a high percentage of softwood fiber for strength. While it is possible to obtain softwood postconsumer or recovered fibers, these fibers generally are considered to be a replacement for virgin hardwood fiber because they are shorter. EPA has limited information regarding the postconsumer fiber content of padded mailers. GSA currently purchases padded mailers containing 5% postconsumer fiber. At least one manufacturer uses 15% postconsumer fiber. In addition, EPA is aware that some manufacturers have been using shredded postconsumer paper and other postconsumer materials as the padding inside the mailer but EPA does not know the total postconsumer fiber content of these mailers.

Based on this information, in the draft RMAN, EPA is recommending that padded mailers contain 5 - 15% postconsumer fiber. EPA requests additional information regarding the use of postconsumer and other recovered fiber in padded mailers.

J. Carrierboard

The 1988 paper procurement guideline did not specifically address carrierboard. EPA subsequently received inquiries about the recommended content level for this item.

Carrierboard is a paperboard impregnated with "wet strength" chemicals, suitable for converting into folding cartons used for packaging. It typically is used for packaging beverage containers. EPA knows of three companies that make this product. Ninety percent of carrierboard is made by two of the companies from a type of paperboard known as solid unbleached sulfate (SUS). Traditionally, SUS has been made as a single ply paperboard, using little or no recovered fiber. In response to demand from their private sector customers, two of the largest SUS manufacturers are now producing carrierboard from SUS containing up to 25% recovered fiber, including 15% postconsumer fiber.

The third manufacturer produces carrierboard from 100% recovered fiber. This manufacturer uses recycled paperboard, rather than SUS. As discussed above, recycled paperboard is a multiply product. Although postconsumer fiber is used in the inner plies of multiply products, EPA does not have data on the specific postconsumer fiber content of the carrierboard made from recycled paperboard.

As far as EPA knows, government agencies do not make direct purchases of carrierboard. It is possible, however, that government agencies will purchase this item in the future for food service applications. Therefore, EPA is recommending content levels for carrierboard in the draft RMAN. Based on the information presented above, in section A-4 of the draft RMAN, EPA recommends content ranges for carrierboard of 25 - 100% recovered fiber, including 15% postconsumer fiber. Procuring agencies should be aware that, because the vast majority of carrierboard is SUS, most of the available "recycled" carrierboard will contain 25% recovered fiber, rather than 100% recovered fiber. EPA requests comment on whether there are different performance characteristics of the two different types of carrierboard (SUS and recycled paperboard) that would require listing them separately in the final RMAN.

EPA notes that the percentages of postconsumer and recovered fiber used in carrierboard varies with the caliper (thickness) of the product required for a given end use. EPA recommends that procuring agencies select the highest levels of postconsumer and recovered fiber practicable for the required end use of the carrierboard. Because carrierboard is used principally for private sector applications, EPA encourages private sector users to seek carrierboard containing postconsumer fiber.

K. Paperboard Products Used by Private Sector Purchasers

During the past three years, private sector purchasers of paperboard products increased their demand for products containing postconsumer fiber. In response, manufacturers introduced several

new paperboard products for applications previously made from paperboard principally containing wood pulp. Carrierboard is one example.

Other examples include plates, cups, and "clam shells" for hot and oily foods. These products are made from a type of paperboard known as solid bleached sulfate (SBS). SBS is used in milk cartons, food service products (e.g., cups and plates), folding cartons, linerboard for corrugated containers and solid fiber boxes, and other packaging and non-packaging uses. As with SUS paperboard, SBS is used primarily in products purchased by the private sector. Government agencies might purchase these items indirectly, as packaging or through food service contractors.

Because it is used in food applications, SBS products must meet federal Food and Drug Administration regulations. These state that manufacturers can use reclaimed fiber "excluding that which bears or contains any poisonous or deleterious substance which is retained in the recovered pulp and that migrates to the food." (21 CFR 176.260)

At least two manufacturers have developed the technical capability to use postconsumer fiber in SBS and meet the FDA requirements. In 1993, one manufacturer introduced an SBS board containing 20% postconsumer fiber. In 1994, another manufacturer introduced disposable food service products containing recovered fiber and 10 - 35% postconsumer fiber. These products include polycoated drinking cups, carryout cartons, "clamshells," and drink carriers. Both manufacturers restrict the grades of postconsumer paper used in order to meet the FDA requirements. EPA applauds the manufacturer's commitment to using postconsumer fiber and encourages other SBS manufacturers to do so. EPA also encourages additional private sector users of these products to specify products containing postconsumer fiber.

Because of the FDA requirements, most SBS paperboard manufacturers have been reluctant to use fiber from postconsumer or other recovered materials. They informed EPA that they are concerned that, if they use this fiber, they will not be able to certify to their customers that there are no poisonous or deleterious substances in the product. They also informed EPA that neither polycoatings nor waxed coatings provide a barrier to migration of deleterious substances.

Because there are limited sources and availability of SBS containing postconsumer fiber, EPA is not recommending content levels for this item in the draft RMAN. EPA requests additional information regarding (1) the use of postconsumer and other recovered fiber in SBS products, in general, and in food grade items in particular, (2) whether and to what extent procuring agencies purchase SBS products, and (3) whether EPA should recommend content levels for these items.

L. Summary of Paperboard and Packaging Recommendations

Table 3 contains EPA's recommended content ranges for paperboard and packaging products.

Table 3. -- Recommendations for Paperboard and Packaging Products

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
Corrugated containers* (300 psi) (300 psi)	40 - 50 30	40 - 50 30
Solid fiber boxes	40	40
Folding cartons**	100	40 - 80
Industrial paperboard (e.g., tubes, cores, drums, and cans)	100	45 - 100
Miscellaneous (e.g., pad backs, covered binders, book covers, mailing tubes, protective packaging)	100	75 - 100
Padded mailers	5 - 15	5 - 15
Carrierboard	25 - 100	15
Brown papers (e.g., wrap- ping paper and bags)	40	20

*The recovered and postconsumer fiber content levels are calculated from the content of each component relative to the weight each contributes to the total weight of the box. Appendix I to the draft RMAN provides an example of how to make this computation.

** The recommended content ranges are not applicable to all types of paperboard used in folding cartons. Cartons made from solid bleached sulfate or solid unbleached sulfate contain no or small percentages of postconsumer fiber, depending on the paperboard source.

M. Summary of Request for Comments on Recommendations for Paperboard and Packaging Products

EPA requests comment on each content level recommendation for paperboard and packaging products discussed in this chapter. In this chapter, EPA also requests comment or information on the following issues:

- Is recovered fiber other than postconsumer fiber used in the manufacture of corrugated containers?
- Are corrugated containers rated at 300 psi or greater available containing more than 30% postconsumer fiber?
- Will the recent increased demand for OCC affect the ability of manufacturers to meet the recommended content levels for corrugated containers?
- Will the imminent availability of additional capacity to make linerboard containing 100% recovered fiber allow manufacturers to exceed the high end of the ranges of recommended content levels for corrugated containers?
- Are there differences in the postconsumer fiber content currently used in coated and uncoated folding cartons?
- Should recommendations for coated and uncoated folding cartons be listed separately because of the differences in their ability to incorporate postconsumer fiber content?
- Will the recent increased demand for OCC affect the availability of folding cartons containing higher percentages of postconsumer fiber?
- Should EPA recommend different content levels for the various industrial paperboard products, based on the specific application(s) for those products?
- Should EPA recommend different postconsumer ranges for coated and uncoated miscellaneous paperboard products, and should there be different content recommendations based on the specific application(s) of the products?
- Are percentages of postconsumer fiber greater than 15% used in padded mailers? What percentages of recovered fiber other than postconsumer fiber are used in padded mailers?
- Are there different performance characteristics of the two different types of carrierboard (solid unbleached sulfate and recycled paperboard) that would require listing them separately in the final RMAN?
- Is postconsumer or other recovered fiber used in solid bleached sulfate paperboard products, in general, and in food grade items in particular?
- Do procuring agencies purchase solid bleached sulfate paperboard products, either directly or indirectly? If yes, to what extent?
- Should EPA recommend content levels for solid bleached sulfate paperboard products?

V. Recommendations for Printing and Writing Papers

A. Background

1. Overview

Printing and writing paper is a broad category of office, writing, and printing papers. It is the largest category of paper products purchased by government agencies. It includes both coated and uncoated papers and bleached and unbleached papers. In 1993, U.S. mills supplied 24 million tons of printing and writing paper, representing 28% of all paper and paperboard. These mills used 2.3 million tons of recovered paper that year.

Printing and writing papers can be made from wood fiber, cotton and linen fiber, and other materials, although cellulose from wood is the predominant fiber used. It is obtained using mechanical or chemical processes, or hybrids of chemical and mechanical processes, to separate the fiber from the other components of the wood. The process used affects the characteristics of the fiber and, therefore, the paper made with that fiber. Papers containing fibers obtained by mechanical pulping processes are referred to as "groundwood" papers, while papers containing fibers obtained by chemical pulping processes are referred to as "freesheet." "Free" refers to the absence of mechanical wood pulp. Pulps obtained by chemical pulping contain little or no lignin, the substance that causes paper such as newsprint to yellow or become brittle.

The 1988 paper procurement guideline provided recommendations for offset printing papers, mimeo and duplicator paper, writing paper (stationery), office papers (e.g., note pads), high-speed copier paper, envelopes, forms bond including computer paper and carbonless, book papers, bond papers, ledger, cover stock, and cotton fiber papers. EPA recommended a 50% waste paper standard for most of these items and a 25% recovered materials standard for cotton fiber papers.

Executive Order 12873 establishes minimum content levels for specified uncoated printing and writing papers. EPA has received inquiries on issues related to the terminology used in the Executive Order. As explained in section V.B below, EPA is incorporating the Executive Order content levels into the draft recommendations for printing and writing papers. EPA also addresses the terminology issues in this section.

In the 1988 procurement guideline, EPA did not differentiate between coated and uncoated papers and did not provide specific recommendations for bristols (e.g., file folders, accordion files, hanging folders). This created confusion about the content level to be used for these items. In the draft RMAN, EPA is recommending content levels for coated printing papers and bristols to remove ambiguity about the content levels applicable to these items. EPA's recommendations for coated papers and bristols are discussed in sections V.C and V.D, respectively.

2. Elimination of "High Grade Bleached" Distinction

The 1988 paper procurement guideline categorized all printing and writing papers as "high grade bleached" paper. However, agencies purchase envelopes and other types of printing and writing paper products which are not made from bleached paper. As a result, agencies, mills, and vendors have been confused about the applicability of EPA's recommendations to unbleached items.

It is EPA's intent that agencies purchase the broadest range of paper and paper products available. To end any confusion about the scope of EPA's recommendations, EPA is eliminating "high grade bleached" from the description of the printing and writing paper category. Procuring agencies should seek to purchase all printing and writing papers, whether bleached or unbleached, which can be made with postconsumer and other recovered fiber satisfying the agencies' minimum content standards.

B. Uncoated Printing and Writing Papers

Uncoated printing and writing papers can be made from either freesheet or groundwood pulp. EPA has been asked whether the 1988 recommendations and the standards in Executive Order 12873 are limited to freesheet papers. EPA wishes to emphasize that both the standards in Executive Order 12873 and the EPA recommendations in the draft RMAN apply to printing and writing papers made from either type of pulp.

1. Executive Order Provisions

Section 504 of Executive Order 12873 requires Federal procuring agencies to purchase selected printing and writing papers meeting or exceeding the following minimum content standards:

- For high speed copier paper, offset paper, forms bond, computer printout paper, carbonless paper, file folders, and white wove envelopes, the standard is 20 percent postconsumer materials beginning December 31, 1994, increasing to 30 percent postconsumer materials beginning December 31, 1998.
- For other uncoated printing and writing papers, such as writing and office paper, book paper, cotton fiber paper, and cover stock, the minimum content standard is 50 percent recovered materials, including 20 percent postconsumer materials beginning on December 31, 1994, increasing to 30 percent postconsumer materials beginning December 31, 1998.
- As an alternative to these standards, the standard is no less than 50 percent recovered materials that are a waste material by-product of a finished product other than a paper or textile product which would otherwise be disposed of in a landfill, as determined by the State in which the facility is located.

Prior to the Executive Order, it generally was thought that the way to foster greater use of postconsumer materials was to establish high postconsumer and recovered fiber content levels.

However, most of the printing and writing paper manufactured in the U.S. is made on the industry's large papermaking machines at vertically integrated mills that produce both wood pulp and paper. Because the operating economics and energy balance at these mills is tied to their use of wood to produce pulp, it is not economically feasible for them to reduce their existing wood pulp-making capabilities significantly in order to substitute high percentages of pulp made from postconsumer or other recovered paper. Paper meeting the 1988 guideline typically have been produced by the industry's small and medium-sized mills. As a result, the paper industry has been able to manufacture only limited quantities of printing and writing papers meeting the 50% "waste paper" content level recommended in the 1988 paper procurement guideline.

Executive Order 12873 establishes a paradigm shift in the way procuring agencies should establish minimum content standards in order to encourage the large printing and writing paper mills to use postconsumer fiber. It establishes lower, postconsumer-only content standards for the types of printing and writing papers commonly manufactured by these larger mills. These papers are often referred to as commodity papers and include reprographic paper, offset paper, forms bond, computer printout paper, and carbonless paper.

Because small and medium-sized paper mills are able to produce printing and writing paper using higher levels of recovered fiber, the Executive Order retains a 50% total recovered materials content level for other types of paper that can be produced by these mills. These papers are often referred to as "specialty" papers and include text and cover papers, cotton fiber papers, and high quality writing and book papers. In order to foster the continued use of postconsumer materials by these smaller mills, the Executive Order also requires that text and cover papers, cotton fiber papers, and high quality writing and book papers purchased by federal agencies contain 20% postconsumer materials.

Executive Order 12873 also provides that agencies can use an alternative standard of "50% recovered materials that are a waste material byproduct of a finished product other than a paper or textile product." Paper or paper products meeting this standard can only contain a specific subset of recovered materials. Two examples of materials that may meet the alternative standard are sawdust and materials such as cotton linters that are a byproduct of processing cottonseed into oil. Procuring agencies should note that these materials meet the alternative standard only if they would be disposed in a landfill if they were not used in paper products.

EPA encourages state and local government agencies, contractors, and private sector purchasers to adopt the new approach used in Executive Order 12873 in order to ensure uniform recovered material content requirements and to foster greater use of postconsumer fiber by all printing and writing paper mills.

Procuring agencies also should note that the 20% postconsumer content levels established by Executive Order 12873 increase to 30% postconsumer content beginning December 31, 1998. EPA considered including both the 20% and 30% content levels in the draft RMAN. Because the draft RMAN differs significantly from the 1988 paper procurement guideline in scope, approach to content levels, and some terminology, EPA concluded that it would be less confusing to agencies if the

RMAN incorporates only the 20% content level at this time. EPA plans to issue revised recommendations incorporating the 30% postconsumer content levels in the future.

2. Terminology

Like the 1988 paper procurement guideline, the Executive Order uses generic industry terms such as "book," "bond," and "offset." Based on conversations with paper company representatives and purchasing agents, EPA has found that the printing and writing papers used for book, bond, and offset applications currently are often used interchangeably. As a result, there is confusion about which content level a paper should contain, because the Executive Order establishes postconsumer-only content levels for offset papers, but two-part content levels for book, writing, and other office papers.

In the draft RMAN, EPA uses new terminology for listing printing and writing papers. The terms "book" and "bond" are no longer used. Instead, EPA is providing more descriptive terms that are based largely on recommendations made by AF&PA's Printing-Writing Paper Division. EPA believes that the new format better reflects the way in which terms are currently used by mills, vendors, and procuring agencies. The following subsections discuss the new terms and EPA's recommendations for each item.

3. Reprographic Papers

In the 1988 paper procurement guideline, EPA recommended 50% waste paper content levels for mimeo, duplicator, and bond papers. The current paper industry terminology for these items is "reprographic paper," which refers to a category of commodity papers that includes business paper grades (both cut-size and copier rolls) such as bond, electrostatic copy, mimeo, duplicator, and reproduction papers for commercial, institutional, and home use. Table 4 identifies the characteristics, common terms/names, and applications or end uses of reprographic papers.

Executive Order 12873 establishes a 20% postconsumer content level for these items. In section A-1 of the draft RMAN, EPA incorporates this content level. In EPA's table of recommendations, the content level is displayed as 20% recovered fiber and 20% postconsumer fiber. This means that the total recovered fiber content of reprographic papers should be 20%, all of which is postconsumer fiber.

Table 4. -- Reprographic Papers Characteristics

Characteristics	Terms/Names	Applications and End Uses (High & Low speed equipment)
<p>Usually small size sheets (8 1/2 x 11", 8 1/2 x 14", or 11 x 17")</p> <p>Usually ream-wrapped</p> <p>Purchases for both high-volume and low-volume needs</p>	<p>Office bonds (white and colored)</p> <p>Copier paper</p> <p>Writing paper (white and colored)</p> <p>Cut-size</p> <p>Multipurpose bond</p> <p>Laser paper</p>	<p>Business communications</p> <p>Xerographic</p> <p>Laser</p> <p>Ink jet</p> <p>Typewriter</p> <p>Mimeo</p> <p>Duplicator</p> <p>Fax</p> <p>Desktop publishing</p> <p>Electronic publishing</p>

4. Offset Papers

In the 1988 paper procurement guideline, EPA listed offset printing paper, book papers, and bond papers separately and recommended 50% waste paper content levels for each item. In current paper industry terminology, however, "offset paper" is a broad category of relatively inexpensive commodity paper used primarily for book publishing, commercial printing, direct mail, technical documents, and manuals. Offset paper can be used for both book and bond applications.

In the 1988 paper procurement guideline, EPA defined "offset printing paper" as uncoated or coated paper. In current paper industry terminology, however, "offset paper" refers to uncoated paper. For this reason, as used in the draft RMAN, "offset" will refer to uncoated papers, while coated offset papers are included with other coated papers.

Offset papers were originally designed primarily for use in offset lithography. They are used on both sheet-fed and web presses. Important properties are good internal bonding, high surface strength, dimensional stability, lack of curl, and freedom from fuzz and foreign surface material. Table 5 identifies the characteristics, common terms/names, and applications or end uses of offset papers.

Executive Order 12873 establishes a 20% postconsumer content level for these papers. In section A-1 of the draft RMAN, EPA incorporates this content level. In EPA's table of recommendations, the content level is displayed as 20% recovered fiber and 20% postconsumer fiber. This means that the total recovered fiber content of offset papers should be 20%, all of which is postconsumer fiber.

Table 5. -- Offset Paper Characteristics

Characteristics	Terms/Names	Applications and End Uses
Used in commercial printing Generally high volume roll and sheet applications	Web offset Sheet-fed offset Opaque offset Offset book Book	Books Manuals Brochures Return postcards Direct mail Catalogs Letterpress

5. Tablet Papers

In the 1988 paper procurement guideline, EPA recommended a 50% waste paper content level for "office paper (e.g., note pads)." In current paper industry terminology, "tablet paper" can be used for this and other applications. Tablet papers are considered to be commodity papers. They must have a good writing surface and resist penetration by inks. Table 6 identifies the characteristics, common terms/names, and applications or end uses of tablet papers.

Executive Order 12873 establishes a content level of 50% recovered materials, including 20% postconsumer materials for "writing and office paper." There are two types of "writing and office papers," however: premium papers and the less expensive papers such as writing tablets. EPA believes that the content levels in the Executive Order were meant for premium writing and office papers that typically are manufactured at small and medium-sized paper mills using 50% recovered fiber, including a percentage of postconsumer fiber. Because tablet papers are a commodity item, EPA believes that they should contain 20% postconsumer fiber, like the other commodity papers. For this reason, in section A-1 of the draft RMAN, EPA is recommending a 20% postconsumer fiber content level for tablet papers. In EPA's table of recommendations, the content level is displayed as 20% recovered fiber and 20% postconsumer fiber. This means that the total recovered fiber content of tablet papers should be 20%, all of which is postconsumer fiber.

Table 6. -- Tablet Paper Characteristics

Characteristics	Terms/Names	Applications and End Uses
Mainly a converting paper	Add roll	Note tablets
Must accept ink without "feathering"	Loose leaf paper	Notebooks
		3-hole punched filler paper
		Adding machine tape
Designed to be hole punched		

6. Forms Bond

In the 1988 paper procurement guideline, EPA listed "form bond including computer paper and carbonless." EPA did not recommend content levels for these items in 1988, but subsequently issued an advisory notice recommending a 50% waste paper content level. In the 1988 guideline, EPA also listed ledger and recommended a 50% waste paper content level for this item.

In current paper industry terminology, "forms bond" includes all bond type papers used for business forms end uses such as continuous, register, sales book, unit set, computer printout, and related multicopy forms, excluding carbonless. Forms bond also is used for some ledger applications. Forms bond papers are generally used in roll form in basis weights ranging from 11 lb to 28 lb (17" x 22" - 500). Table 7 identifies the characteristics, common terms/names, and applications or end uses of these papers.

Executive Order 12873 establishes a 20% postconsumer content level for these papers. In section A-1 of the draft RMAN, EPA incorporates this content level. In EPA's table of recommendations, the content level is displayed as 20% recovered fiber and 20% postconsumer fiber. This means that the total recovered fiber content of forms bond papers should be 20%, all of which is postconsumer fiber.

Table 7: -- Forms Bond Characteristics

Characteristics	Terms/Names	Applications and End Uses
Generally high-volume rolls for fan-folded applications	Register bond	Printing of bills, checks, etc.
Must perforate and hole punch effectively	Continuous forms bond	Fan-folded, perforated forms
For impact and non-impact printing	Computer printout (CPO)	Multi-part forms
	Computer printing paper (Green bar)	Computerized reports
	MICR/OCR forms	Sales books
	Ledger paper	Ledgers

7. Envelopes

In the 1988 paper procurement guideline, EPA listed envelopes and recommended a 50% waste paper content level for these items. EPA defined "envelopes" as brown, manila, padded, or other mailing envelopes not included with "stationery." In other words, this category included both wove and kraft envelopes. As explained below, in the draft RMAN, EPA differentiates between wove and kraft envelopes and provides separate content recommendations for each because their differing strength requirements impact their ability to be manufactured with postconsumer and other recovered fiber.

Envelopes can be made from many different types of printing and writing papers. There are three basic types of envelopes: custom, wove, and kraft.

Custom envelopes are made to match letterhead, cards, or other printed material and are made from paper specified by the purchaser. As the name implies, custom envelopes are made from specialty papers. This category includes envelopes made from cotton fiber papers and text (stationery) papers. EPA's recommendations for cotton fiber papers and text papers, including matching envelopes, are discussed below in subsections V.B.8 and V.B.9, respectively.

Because of the applications for which envelopes are used, envelope papers must have different characteristics than other papers. Generally, an envelope's function is to contain and protect its contents and to ensure safe delivery via mail, courier, or other mode of delivery. Envelope paper must withstand the stresses to which it is subjected during its functional life, from forming on the paper machine, through converting into envelopes, printing, inserting, mailing, sorting, and delivery. Not only must envelope paper have adequate strength and printability, but it also must not interfere with the optical scanning equipment used by the U.S. Postal Service. In particular, dirt count, brightness, and use of fluorescent brighteners can affect optical scanners.

a. Wove envelopes. Wove envelopes are made from "envelope converting grade," which is a commodity paper. Wove envelopes generally are white, although they also can be colored.

Executive Order 12873 establishes a 20% postconsumer content level for white wove envelopes. In section A-1 of the draft RMAN, EPA incorporates this content level. In EPA's table of recommendations, the content level is displayed as 20% recovered fiber and 20% postconsumer fiber. This means that the total recovered fiber content of white wove envelopes should be 20%, all of which is postconsumer fiber.

The Executive Order did not establish a content level for colored wove envelopes. Only two mills manufacture colored wove envelope paper. Currently, one of these mills does not use recovered fiber, while the other manufactures colored wove envelope paper containing 50% recovered fiber, including 10% postconsumer fiber. EPA believes that colored wove envelope paper should be viewed as analogous to white wove envelope paper for purposes of postconsumer and recovered fiber content. Therefore, in section A-1 of the draft RMAN, consistent with the Executive Order's goal of encouraging use of postconsumer fiber in commodity grade papers, EPA recommends a content level of 20% postconsumer fiber for colored wove envelope papers. As with white wove envelopes, the content level is displayed as 20% recovered fiber and 20% postconsumer fiber, meaning that the total recovered fiber content of colored wove envelopes should be 20%, all of which is postconsumer fiber.

b. Kraft envelopes. Kraft envelopes, which are often used for mailing large, thick documents, are made from papers containing a high percentage of softwood fiber for strength. Kraft envelopes can be made from bleached, semibleached, or unbleached kraft paper. White kraft envelope paper is bleached. Bleached kraft envelope paper can be tinted or colored to produce "golden," "brown," or "manila" envelopes. Unbleached or natural kraft envelopes have a dark brown appearance similar to grocery bag paper and are primarily sold to government markets.

Executive Order 12873 did not establish a content level for kraft envelopes. Use of postconsumer and recovered fiber has been difficult in kraft envelope papers because these fibers are inherently weaker than kraft fiber from wood. While it is possible to obtain postconsumer or recovered fiber with high softwood content, these fibers generally are considered to be a replacement for virgin hardwood fiber because they are shorter in length, similar to virgin hardwood fiber. The fact that kraft envelope papers must be strong affects the amount of postconsumer and recovered fiber that can be used.

With one exception, the mills producing kraft envelope paper are fully integrated mills that purchase market pulp for the postconsumer fiber component of their products. A 50% recovered fiber content level would be an economic barrier to increased production of envelope paper containing postconsumer or recovered fiber, just as it is for other commodity grade printing and writing papers.

There are five major manufacturers of kraft envelope paper. The two manufacturers of white kraft envelope paper and the three manufacturers of colored kraft envelope paper use 10 - 20% postconsumer fiber. Of the two manufacturers of unbleached kraft envelope papers, one uses no postconsumer or recovered fiber and the other uses 10% postconsumer fiber.

Based on this information, in section A-1 of the draft RMAN, EPA recommends the following content levels for kraft envelope papers: white and colored kraft envelope papers -- 10 - 20% postconsumer fiber; and unbleached kraft envelope papers -- 10% postconsumer fiber. In EPA's tables of recommendations, the content level for white and colored kraft envelopes papers is displayed as 10 - 20% recovered fiber and 10 - 20% postconsumer fiber. This means that these envelopes can contain either all postconsumer fiber (e.g., 20% recovered fiber, all of which is postconsumer) or blends of recovered and postconsumer fiber (e.g., 20% recovered fiber, including 10% postconsumer fiber). The content level for unbleached kraft envelope papers is displayed as 10% recovered fiber and 10% postconsumer fiber, meaning that these envelopes should contain 10% recovered fiber, all of which is postconsumer fiber.

Based on past experience with manufacturers' response to the Agency's recommendations, EPA believes that these content levels will stimulate all kraft envelope paper mills to increase their usage of postconsumer fiber. EPA notes that availability of both white kraft and unbleached kraft envelopes containing postconsumer fiber is currently limited, and these items might not be price competitive. Therefore, while EPA is recommending content levels for these items, procuring agencies should research product availability in their local markets.

c. Padded envelopes. Padded envelopes are not considered to be "envelopes" by either GSA or the envelope sector of the paper industry. Instead, they are considered to be packaging materials and were addressed previously in chapter IV.

8. Cotton Fiber Papers

Cotton fiber papers are high quality printing and writing papers used for stationery, invitations, currency, ledgers, maps, and other specialty uses. They contain a minimum of 25% recovered cotton or linen fiber and can contain as much as 100% of this fiber. The recovered materials include cotton linters and other materials recovered from cottonseed processing, as well as trimmings from cotton and linen textile mills.

Table 8 identifies the characteristics, common terms/names, and applications or end uses of cotton fiber papers.

Table 8. -- Cotton Fiber Paper Characteristics

Characteristics	Terms/Names	Applications and End Uses
Cotton/linen fiber used as a portion of the sheet's fiber content	Watermarked bond Premium bond/writing paper	Premium letterhead and stationery, including matching envelopes Ledgers
Special quality, durability, and texture	Rag paper Cotton content sheet	Permanent records Art and engineering papers Wills, deeds, stocks, bonds Premium advertisements

In the 1988 paper procurement guideline, EPA recommended a content level of 25% "recovered materials" for cotton fiber papers. EPA explained that these papers contained fiber from materials recovered from cottonseed processing and textiles, rather than fiber from recovered paper.

Executive Order 12873 establishes a standard of 50% recovered materials, including 20% postconsumer materials for cotton fiber papers. In section A-1 of the draft RMAN, EPA incorporates this content level.

Stationery (i.e., writing papers, including matching envelopes) is the type of cotton fiber paper most commonly purchased by government agencies. Procuring agencies also purchase ledger, maps, invitations, and other items containing cotton fiber paper. EPA is not aware of any technical or performance constraints on the use of 50% recovered fiber, including 20% postconsumer fiber, in these other cotton fiber paper products.

Cotton fiber paper manufacturers raised three issues regarding interpretation of Executive Order 12873. First, they requested that their product be treated the same under the Executive Order as it was under EPA's 1988 guideline. They argue that the term "recovered materials," as applied to their product, should include recovered cotton and linen, rather than being limited to fiber from recovered paper. They provided information, which EPA has placed in the public docket, regarding the quantities of cotton/linen fiber generated, the quantities of recovered cotton/linen fiber that they consume, and the lack of alternative uses for these materials.

In brief, their submittal states that 680 million pounds of cotton linters were generated in 1993. The majority of this material was converted into pulp for use by the paper industry. Correspondence from the four states in which most of this material is generated (Texas, Arkansas, Tennessee, and Mississippi), indicates that there are no significant alternative uses for this material.

Based on this information, EPA recommends that, in implementing the standard for cotton fiber papers established by Executive Order 12873, procuring agencies specify that the recovered fiber component can include recovered cotton/linen fibers.

Second, cotton fiber paper manufacturers also inquired whether fiber from postconsumer cotton or linen could be used to meet the Executive Order's 20% postconsumer content level. According to anecdotal information related to EPA, some cotton fiber mills are using postconsumer cotton or linen fiber. At least one of the cotton fiber mills also uses recovered old currency to produce stationery and office supplies such as Post-It™ notes. Based on this information, EPA recommends that procuring agencies specify that the 20% postconsumer fiber component can be derived either from postconsumer paper or textiles. In other words, the postconsumer fiber requirements for cotton fiber papers can be met by the use of fiber derived either from postconsumer paper or postconsumer cotton/linen materials.

Finally, cotton fiber paper manufacturers asked whether their product met the Executive Order's alternative standard of 50% recovered materials that are a by-product of a finished product other than a paper or textile product. EPA believes that cotton fiber papers containing 50% fiber from cotton linters satisfies the criteria of the alternative standard in the Executive Order. Cotton linters are derived from cottonseeds during production of cottonseed oil. As a result, they are an agricultural by-product, rather than a by-product of the paper or textile industries.

In sum, in section A-1 of the draft RMAN, EPA is incorporating the Executive Order provision that cotton fiber papers contain 50% recovered fiber, including 20% postconsumer fiber. The recovered fiber component can consist of fiber derived from cotton linters, cotton or linen textiles, or similar materials, as well as from recovered paper. Similarly, the postconsumer fiber can be derived either from postconsumer cotton and fiber materials or postconsumer paper. Procuring agencies also can choose to use the Executive Order's alternative standard when purchasing cotton fiber papers.

9. Text and Cover Papers

In the 1988 paper procurement guideline, EPA recommended 50% waste paper content levels for writing paper (stationery), book papers, and cover stock. The paper industry term, "text and cover paper," encompasses these items. Traditionally, text and cover papers are considered to be specialty papers. They are premium uncoated printing and writing papers manufactured from either wood-based fiber or cotton fiber. They are made in a wide variety of finishes, including smooth, antique, vellum, laid, felt-marked, patterned and/or embossed surfaces, and are characterized by excellent folding qualities, printability, and durability. They are used for a wide range of graphic techniques. Table 9 identifies the characteristics, common terms/names, and applications or end uses of text and cover papers.

Executive Order 12873 establishes a standard of 50% recovered fiber, including 20% postconsumer fiber for these papers. In section A-1 of the draft RMAN, EPA incorporates this content level. In EPA's table of recommendations, the content level is displayed as 50% recovered fiber and 20% postconsumer fiber. This means that the total recovered fiber content of text and cover papers should be 50%, including 20% postconsumer fiber.

Table 9. -- Text and Cover Paper Characteristics

Characteristics	Terms/Names	Applications and End Uses
Full range of basis weights, palette of colors, and sheet finishes, including embossed products	Premium text	Fine books
	Premium cover	Premium brochures, booklets, annual reports, advertisements
	Duplex cover	Premium letterhead and stationery, including matching envelopes
Generally used in specialty, sheet-fed printing applications	Premium bond/writing	Covers, inserts, pocket folders, menus
	Parchment	

10. Supercalendered Paper

The 1988 paper procurement guideline did not address supercalendered paper, which was not then available containing postconsumer or recovered fiber. Executive Order 12873 also did not establish a content level for this paper. As explained in this subsection, this type of paper currently is available containing postconsumer fiber.

Calendering is a process for pressing paper with rolls to create a smooth surface for printing. In supercalendering, paper is passed between a series of hard and soft rolls to create a smooth, highly glazed surface. Supercalendered paper is used for printing applications such as advertising inserts, catalogs, mail order inserts, and some magazines. It often competes with a coated paper known as lightweight coated groundwood in magazine publishing applications. (Coated papers are discussed below in section V.C.)

In the past five years, magazine publishers have increased their use of supercalendered paper. Manufacturers of supercalendered paper recently began using postconsumer fiber in their product to meet demand from the magazine publishers. Supercalendered paper containing postconsumer fiber is expected to account for one-third of the supercalendered paper used by magazine publishers in 1995.

According to GPO, federal agencies are not currently using supercalendered paper. However, because it competes with lightweight coated groundwood, which is used in some federal publications, EPA anticipates that supercalendered paper could be used for federal printing applications in the future. For this reason, EPA is adding a recommended content level for supercalendered paper in the draft RMAN.

There are three manufacturers of supercalendered printing papers. They currently are using 10% postconsumer fiber in some of their products. They are not able to use higher percentages of postconsumer fiber at this time because they have found that higher percentages adversely affect the

technical performance of the paper. Specifically, higher percentages affect the optical qualities of the paper.

Based on this information, in section A-1 of the draft RMAN, EPA recommends a content level of 10% postconsumer fiber for this item. In EPA's table of recommendations, the content level is displayed as 10% recovered fiber and 10% postconsumer fiber. This means that the total recovered fiber content of supercalendered paper should be 10%, all of which is postconsumer fiber.

11. Safety Paper

"Safety" paper is used in the manufacture of commercial and government checks. The U.S. Treasury Department specifies special properties for the safety paper used in federal government checks and U.S. Savings Bonds in order to deter counterfeiting and tampering. Treasury's paper suppliers experimented with postconsumer fiber but were unable to produce a paper meeting Treasury's requirements. Treasury officials informed EPA that they will continue to pursue use of postconsumer fiber in safety paper, particularly for savings bonds. Executive Order 12873 did not establish content levels for this type of paper.

EPA notes that check paper containing postconsumer fiber is available to commercial printers. At least three manufacturers produce check safety paper containing 10% postconsumer fiber. Paper containing higher levels of postconsumer fiber currently are not available and may not be available in the foreseeable future for two reasons. First, there is limited availability of the grades of recovered fiber that meet manufacturers' specifications. Second, checks are run through high-speed sorting equipment, and the manufacturers report that higher levels of postconsumer fiber can lead to increased jamming in the equipment. EPA encourages banks and commercial check printers to purchase check safety paper containing postconsumer fiber and encourages mills to increase their postconsumer fiber usage, if possible without affecting performance.

Based on this information, in section A-1 of the draft RMAN, EPA is recommending a content level of 10% postconsumer fiber for check safety paper. In EPA's table of recommendations, the content level is displayed as 10% recovered fiber and 10% postconsumer fiber. This means that the total recovered fiber content of check safety paper should be 10%, all of which is postconsumer fiber.

It is EPA's intent that this recommendation be used by state and local government agencies and by private sector purchasers of checks. As previously discussed, paper containing postconsumer fiber currently does not meet federal specifications. EPA encourages the U.S. Treasury Department to continue to work with its suppliers to develop safety paper containing postconsumer fiber for use in federal checks and U.S. savings bonds.

EPA requests information on state agency requirements for the paper used to print state checks, including differences, if any, from federal and commercial check requirements. Further, EPA requests information on the availability of paper containing recovered and postconsumer fiber to meet the state agencies requirements.

12. Summary of Recommendations for Uncoated Printing and Writing Papers

Table 10 displays the content recommendations found in the draft RMAN. It also summarizes the terminology changes.

Table 10. -- Uncoated Printing and Writing Papers

Revised or New Item	1988 Item	The Content Recommendation	
		Postconsumer Fiber (%)	Recovered Fiber (%)
Reprographic Paper	Mimeo and duplicator paper Paper for high-speed copiers Bond paper	20	20
Offset Paper	Offset printing Book paper Bond paper	20	20
Tablet Paper	Office paper (e.g., note pads)	20	20
Forms Bond	Form bond including computer paper and carbonless* Ledger	20	20
Envelope Paper	Envelopes	20	20
Wove			
Kraft		10 - 20	10 - 20
White		10 - 20	10 - 20
Colored (including manila)		10 - 20	10 - 20
Unbleached		10	10
Cotton Fiber Paper, Including Cotton Fiber Envelopes	Writing (stationery) Ledger Cotton fiber papers	20 (including postconsumer textile fiber)	50 (including recovered cotton and linen fiber)

Revised or New Item	1988 Item	The Content Recommendation	
		Postconsumer Fiber (%)	Recovered Fiber (%)
Text & Cover Paper, Including Matching Envelopes	Writing (stationery) Book paper Cover stock	20	50
Supercalendered	--	10	10
Check Safety Paper**	--	10	10

*Carbonless is now listed under coated papers.

**This recommendation is not intended for paper used in federal checks and U.S. savings bonds. EPA encourages the U.S. Treasury Department to continue to work with its suppliers to develop safety paper containing postconsumer fiber for use in these items.

C. Coated Papers

The 1988 paper procurement guideline did not differentiate between uncoated and coated papers. Because some of the definitions (e.g., offset paper) referred to both coated and uncoated papers, it was unclear whether the 50% waste paper recommendation applied to coated papers. Since 1988, mills have developed coated papers containing recovered fiber, including postconsumer fiber. In addition, EPA found that some agencies are purchasing small quantities of coated paper. Therefore, EPA is recommending content levels for coated papers in the draft RMAN.

1. Background

Coated papers consist of an uncoated base paper coated with pigments, clays, adhesives, and/or other additives to provide improved gloss, slickness, color, printing detail, and brilliance to the paper. The base paper can be either groundwood or freesheet. Coated groundwood papers represented 54% of all U.S. coated paper shipments in 1992, while the remainder of coated papers were freesheet.

Coated papers can be finished in gloss, dull, or matte finishes. They generally are used in printing and publishing applications (e.g., annual reports, posters, brochures).

Coated papers are available in six grades, from Premium to No. 5, corresponding to the brightness and basis weights of the paper. The heavier basis weight sheets (i.e., premium coated papers and No. 1 - 3) are freesheet papers. Half of the No. 4 papers and all of the No. 5 papers are groundwood papers. The federal government purchases primarily No. 1, No. 3, and No. 4 coated papers, although No. 5 papers are used for some publications.

Coatings are applied by rolls, air knives, or trailing blades. Blade coating, in particular, is the predominant coating technology used in the U.S. During the blade coating process, a slurry of clay-based coating is applied, and excess material is immediately scraped off with a blade which runs extremely close to the sheet. Blade coating machines can run up to 5,000 feet per minute and can coat both sides of the sheet simultaneously.

In addition to excess coating materials, the blade picks up any contaminants not previously dissolved in the fiber cleaning process. Contaminants can stick to the blade and drag through the wet coating to create scratch marks or streaks. Because coated papers are used for high-quality printing, streaks or drag marks are unacceptable. In addition to being aesthetically displeasing, the scratches can create weaknesses in the base paper, which can result in breaks either during the paper manufacturing process or during high-speed printing operations.

Coated printing papers come in basis weights ranging from 28 lb. to 100 lb. There are both coated one-side (C1S) papers for labels, packaging, and covers, and coated two-side (C2S) papers for book, publication, and commercial printing. The lighter weight sheets, particularly lightweight coated groundwood sheets, are used primarily for high volume, four-color publications, including magazines, newspaper inserts and supplements, catalogs, advertising packages, and flyers.

2. Use of Recovered Fiber

During the past several years, paper mills began to use recovered fiber, including postconsumer fiber, in the production of coated printing papers. Due to the nature of the manufacturing process and printing performance requirements, it is necessary that the pulp used in coated paper base sheets contain high-quality, consistent materials. In the past, mills had reported problems with sheet cleanliness, dirt, and brightness, and with contaminants on the blade coater when using postconsumer fibers. As the quality of deinked pulps have improved, however, mills have been able to use 10% or more postconsumer fiber in their coated paper products.

Mills use varying amounts of postconsumer fiber, depending on pulp availability, economics, and the basis weight of the sheet being manufactured. In a coated sheet, coatings can account for 25-35% of the basis weight of the sheet. As a result, the base sheet is thinner than the finished sheet, and the fibers used to produce it must be relatively strong. For example, a typical 40 lb. lightweight coated groundwood sheet contains a 28 lb. basis weight uncoated base sheet. This means that the base sheet must have the proper fiber mix to retain sheet strength. Long, consistent fibers are necessary to maintain the strength of the paper both on the manufacturing equipment and on high-speed printing equipment.

While base sheet strength is a concern in all coated sheets, it is particularly critical in lighter weight sheets. In order to maintain consistency from one lot to another, the fiber characteristics must be the same from batch to batch. The use of high percentages of postconsumer fiber introduces inconsistent fibers, which can weaken the base sheet.

During the past three years, partly due to demand from private sector customers such as magazine and catalog publishers and direct marketers, mills have gained experience using

postconsumer fiber. Magazine publishers purchase over 50% of the No. 4 and No. 5 grades of coated paper. They have been increasing their use of lighter weight papers containing recovered fiber depending on the availability and price of these products.

The major manufacturers of coated papers containing postconsumer fiber informed EPA that they have recently experienced a deterioration, nationwide, in the quality of recovered paper. As a result, they have found an increase in down-time due to streaks, holes, and breaks in the paper (web breaks), as well as a 4 - 6% increase in the quantity of paper rejected at the end of the papermaking process.

Currently, all 19 U.S. companies that manufacture coated papers produce at least one line of coated papers containing recovered fiber. Most of these papers are in basis weights of 38 lb. or greater and are coated freesheet papers, not coated groundwood papers. Supplies of this paper are limited, however. In 1993, coated freesheet papers containing postconsumer fiber accounted for only 350,000 tons out of the 3.9 million tons supplied.

Every domestic "recycled" coated paper contains at least 10% postconsumer fiber. The "recycled" content papers tend to cost more than competing papers made with virgin fibers. The lighter weight sheets (basis weight of 38 lb. or less) typically contain 10% postconsumer fiber. While some of the heavier basis weight coated papers now contain up to 15% postconsumer fiber, with one mill producing heavier weight coated papers containing up to 30% postconsumer fiber, only 5,000 tons of lightweight coated paper containing 15% or more postconsumer fiber was manufactured in 1994. All of it was used by magazine publishers. Manufacturers informed EPA that they will not produce significantly increased quantities of coated paper containing 15% postconsumer fiber because of the increased levels of contamination that they are finding in recovered paper supplies.

Based on this information, EPA concludes that it is unlikely that coated papers containing more than 10% postconsumer fiber will be available at this time in appreciable quantities or at competitive prices. For this reason, in section A-1 of the draft RMAN, EPA recommends a 10% postconsumer content level for coated papers. In EPA's table of recommendations, the content level is displayed as 10% recovered fiber and 10% postconsumer fiber. This means that the total recovered fiber content of coated papers should be 10%, all of which is postconsumer fiber.

EPA will monitor the availability of coated papers containing higher levels of postconsumer fiber and increase the recommended content level in the future, as appropriate.

3. Carbonless Paper

In the 1988 paper procurement guideline, EPA included carbonless paper with forms bond. EPA did not recommend a content level for carbonless paper in 1988, but subsequently issued an advisory notice recommending a 50% waste paper content level.

Carbonless paper is used in the production of multiple impact copy forms. The paper contains special coatings and/or encapsulation on the back of the top sheet (coated back or CB) and

front of the bottom sheet (coated front or CF) in a two-part form. In multi-part forms, some of the sheets are coated on the front and back (CFB).

Executive Order 12873 establishes a 20% postconsumer content level for carbonless paper. In section A-1 of the draft RMAN, EPA incorporates this content level. In EPA's table of recommendations, the content level is displayed as 20% recovered fiber and 20% postconsumer fiber. This means that the total recovered fiber content of carbonless papers should be 20%, all of which is postconsumer fiber.

4. Summary of Coated Paper Recommendations

Table 11 summarizes the coated paper recommendations.

Table 11. -- Recommended Coated Paper Content Levels

Item	Postconsumer Fiber (%)
Coated Printing Papers	10%
Carbonless	20%

D. Bristols

EPA has received numerous inquiries about the appropriate recovered fiber content standards for products such as greeting cards and file folders. The paper grade used to make these items is generally known as "bristols" within the paper industry.

1. Background

Bristols account for only a small portion (3%) of U.S. paper production. Federal government purchases of bristol products such as file folders and index paper constitute a significant percentage of all federal paper purchases, however. Between July 1, 1989 and December 3, 1990, purchases of file folders and index paper accounted for about 9% of all paper purchases by GSA.

"Bristols" is a generic term for a heavy-weight class of paper. Bristols can be classified as either printing and writing papers or paperboard, depending on the thickness, end use, and type of paper machine used to produce them. The differences in the manufacturing process and ultimate end use determine how much postconsumer and other recovered fiber can be used in them.

The 1988 paper procurement guideline included general definitions of "paper" and "paperboard," which distinguished between them based on their thickness (caliper). The definition of "paperboard" states, in part, that sheets that are 0.012 inch (12 pt.) or more in thickness are generally classified as paperboard. The 1988 guideline did not specifically address bristols, which created confusion about the appropriate minimum content level to use for these items. Based on their varying

thicknesses of 6 pt. to 36 pt., bostols straddle the line between printing papers and paperboard. This distinction is significant because, in the 1998 paper procurement guideline, EPA recommended a 50% waste paper level for printing and writing papers and an 80% postconsumer materials level for recycled paperboard.

2. Definition

There is no universally accepted definition of the term "bristol." AF&PA defines a category known as "solid bleached bostols" as a "class of heavy-weight papers used primarily for graphic communications, for business, office, and school supplies. End uses include such items as advertising pieces, soft bound book covers, greeting cards, menus, file folders, note cards, and baggage tags." For statistical purposes, AF&PA further defines printing and writing bostols to include tabulating index, tag and file folder, coated cover bostols, and uncoated bostols (index, printing, and postcard). AF&PA considers other bostols to be paperboard for statistical purposes.

Paper merchants use the term bristol to refer to a specific end-use for a grade of heavy-weight paper. Examples are "wedding bostols" and "vellum bostols." Paper manufacturers often use the type of paper machine on which a grade is produced to determine its classification as either printing and writing paper or paperboard. For example, C1S (coated one side) bristol/cover is produced on a Fourdrinier machine and is classified under printing and writing papers. Railroad board and similar items, while similar in thicknesses and appearance to C1S, are grades produced on cylinder machines and are considered to be paperboard grades.

Rather than trying to resolve the question of the appropriate definition of bostols, EPA concludes that the best approach to recommending recovered and postconsumer fiber content levels for this grade is to list individual items commonly procured by government agencies. These items are used in printing and office products applications, so they will be added to the list of printing and writing papers for which EPA recommends content levels. This approach is consistent with industry practice of using product application as a criterion for categorizing bostols.

3. Content Levels

Bostols produced on papermaking machines that typically run at high velocities and produce paper in high volumes can accommodate only limited amounts of postconsumer fiber, for the same economic, technical, and product quality reasons that apply to other commodity grade printing and writing papers. Bostols produced on papermaking machines that produce multi-ply papers can handle higher postconsumer content because these fibers are contained in the inside plies.

Items made from bostols include manila file folders, dyed filing products (e.g., red accordion files and hanging file folders), index and postal cards, pressboard report covers, pressboard binders, and tags and tickets.

a. File folders. This category includes both manila folders and brightly-colored file folders. Executive Order 12873 establishes a 20% postconsumer content level for file folders. In section A-1 of the draft RMAN, EPA incorporates this content level. In EPA's table of recommendations, the

content level is displayed as 20% recovered fiber and 20% postconsumer fiber. This means that the total recovered fiber content of file folders should be 20%, all of which is postconsumer fiber.

EPA research indicates that there are technical difficulties in using high levels of postconsumer fiber in file folders, which may result in limited availability of file folders containing 20% postconsumer fiber in the immediate future. In particular, mills report the need for adequate fiber bonding and strength and for consistent pulp to meet shade and cleanliness requirements. Fiber bonding and strength are very important in file folder grades because the fibers must withstand repeated folding and unfolding without breaking (tearing) during file folder handling. File folders generally are made with virgin softwood kraft fiber, and displacing it with recovered fiber could adversely affect fold, burst, and tensile strength.

As a result, procuring agencies might find limited availability of file folders containing 20% postconsumer fiber in the short-term. Based on past history with manufacturers' response to the Agency's recommendations, however, EPA believes that the content levels established by the Executive Order will foster increased availability of file folders containing higher levels of postconsumer fiber.

b. Dyed filing products. Items such as red wallets and hanging folders are dyed. By contrast, brightly colored file folders are printed with colored inks. The pulps used to produce dyed filing products must have a high kraft content to impart the strength, stiffness, and fold characteristics required for the end use. Because the products are dyed, however, the manufacturers do not require as "clean" a mix of postconsumer fiber as do manufacturers of manila file folders. For this reason, EPA believes that dyed filing products should contain the same minimum percentage of postconsumer fiber as file folders. While EPA has only limited information on dyed filing products, the Agency is aware that some manufacturers are producing these products containing up to 50% total recovered fiber.

Based on this information, in section A-1 of the draft RMAN, EPA recommends content ranges for dyed filing products of 20 - 50% recovered fiber, including 20% postconsumer fiber.

c. Index and card stock. The Federal government purchases a high volume of index and postal card stock. For example, GPO reported that between July 1992 and July 1994, it purchased 3.5 million sheets of index stock and slightly over 13 million sheets of U.S. postal card stock. Between July 1989 and December 1990, GSA purchased over \$4 million worth of index paper products.

Manufacturers of index stock have been able to use higher levels of recovered fiber, including postconsumer fiber. At least three manufacturers produce index stock containing 50% recovered fiber, including 10% postconsumer fiber. One manufacturer uses 50% recovered fiber, including 20% postconsumer fiber. A cotton fiber mill produces index stock containing 50% recovered fiber, including 15% postconsumer fiber. No manufacturers indicated that there are technical constraints to increasing postconsumer content to 20% or that ranges of postconsumer or recovered fiber in these products.

Based on this information, EPA believes that index and card stock can be produced containing 50% recovered fiber, including 20% postconsumer fiber. In section A-1 of the draft RMAN, EPA is recommending this content level for index and card stock.

Although EPA's recommendations are intended for government agencies, EPA recognizes that greeting card manufacturers developed product lines containing postconsumer and recovered fiber in response to the 1988 paper procurement guideline. The manufacturers requested that EPA (1) clarify that bristols used in greeting cards fall under printing and writing paper, rather than paperboard, and (2) recommend minimum content standards for their products. EPA agrees that the bristols used in the manufacture of greeting cards are properly considered to be printing and writing papers.

As far as EPA knows, government agencies do not typically purchase greeting cards. Because it is conceivable that they could purchase these products, EPA would like to add postconsumer and recovered fiber content recommendations for greeting cards. EPA notes that greeting card manufacturers have been able to produce cards containing 50% recovered fiber, including 10% postconsumer fiber. EPA is unaware of any performance constraints that would preclude greeting card manufacturers from using 20% postconsumer fiber. However, EPA lacks current research on greeting card manufacturers ability to use paper containing higher levels of postconsumer fiber. For this reason, EPA is not recommending content levels for greeting cards in the draft RMAN. EPA requests comment on the performance and availability of greeting card stock containing higher percentages of postconsumer fiber.

d. Pressboard. In the April 20, 1994 CPG, EPA proposed to designate binders. EPA noted that chipboard and other paperboard binders are covered by the paper procurement guideline (59 FR 18880). Commenters requested that EPA clarify that pressboard and chipboard are two different products and that different content levels should be used for pressboard, chipboard, and other paperboards.

Pressboard is a high-strength paperboard that is laminated in several plies to form a stiff, strong product used in the manufacture of office products such as binders and report covers.⁹ It is a different product from chipboard, which is a low density, solid or lined paperboard that is used in low-strength applications.

Pressboard used for binders and report covers is aesthetically and functionally different from chipboard because it is not covered with cloth or plastic. The pressboard performs the hinge function while at the same time providing the aesthetic attributes appropriate to its function as a binder cover. By contrast, chipboard is used as filler and is covered by cloth or plastic, which provide the hinging function.

Although pressboard is made in a similar papermaking process as other paperboards, it is a thinner product more like bristols than paperboard. Additionally, it shares performance

⁹Pressboard is also used in construction and insulation applications. These applications are addressed as laminated paperboard in EPA's April 20, 1994 CPG and companion RMAN.

characteristics with printing papers because printing can be applied to it. For these reasons, EPA is providing recommendations for pressboard in the printing and writing category, rather than in the paperboard category. (Chipboard was discussed in chapter IV.)

At least three manufacturers produce pressboard. Only one manufacturer provided information to EPA on the recovered fiber content of its products. This manufacturer uses 50% recovered fiber, including 25 - 30% postconsumer fiber. The manufacturer commented, however, that higher postconsumer content levels would affect the aesthetic and strength characteristics of their product. EPA has no technical information indicating that this content level is infeasible for the other manufacturers of pressboard. Therefore, in section A-1 of the draft RMAN, EPA recommends a content level of 50% recovered fiber, including 25 - 30% postconsumer fiber, for this item.

e. Tags and tickets. Tag and ticket grades are available from at least four mills with postconsumer fiber content ranging from 10 to 20%. Three of the four offer a product containing 20% postconsumer fiber. Only one manufacturer uses recovered fiber (at a 50% level) in addition to postconsumer fiber. Based on this information, in section A-1 of the draft RMAN, EPA is recommending content levels of 20 - 50% recovered fiber, including 20% postconsumer fiber for tags and tickets.

f. Solid unbleached sulphate. Another type of bristol, often referred to as solid unbleached sulphate (SUS), is considered to be a packaging product by the paper industry, although it can be printed when used in packaging. SUS was addressed in chapter IV.

4. Summary of Bristols Recommendations

Table 12 summarizes EPA's recommended content levels for printing and writing bristol products. EPA recommends that procuring agencies establish minimum content standards for bristols consisting of a percentage of recovered fiber, including a percentage of postconsumer fiber. For some items, these percentages will be the same. For example, for manila file folders, a procuring agency can express the standard as 20/20 (meaning 20 recovered fiber, all of which is postconsumer) or simply as 20% postconsumer fiber.

Table 12. -- Recommended Printing and Writing Bristols Content Levels

Item	Postconsumer Fiber (%)	Recovered Fiber (%)
File folders (manila and colored)	20	20
Dyed filing products	20	20 - 50
Cards (index, postal, and other, including index sheets)	20	50
Pressboard report covers and binders	25 - 30	50
Tags and tickets	20	20 - 50

E. Summary of Request for Comments on Recommendations for Printing and Writing Papers

EPA requests comment on each content level recommendation for printing and writing papers discussed in this chapter, with the exception of the content levels established by Executive Order 12873. In this chapter, EPA also requested comment or information on the following issues:

- State agency requirements for the paper used to print state checks, including differences, if any, from federal and commercial check requirements.
- The availability of safety paper containing recovered and postconsumer fiber to meet the state agencies requirements.
- The performance and availability of greeting card stock containing higher percentages of postconsumer fiber.

VI. OTHER ISSUES

In addition to the inquiries about content levels for specific products that were discussed in the previous chapters, EPA has received inquiries about the following issues: (1) whether postconsumer and recovered fiber content should be measured as a percentage of fiber weight or total sheet weight, (2) whether mill broke generated by a papermaking process that uses postconsumer or recovered fiber can be included in content calculations, (3) whether the definition of "postconsumer" includes printers' over-runs, converters' scrap, and/or over-issue publications, (4) which definition of "recovered materials" applies to the content standards established in Executive Order 12873, and (5) whether a paper product converted from off-specification paper or obsolete inventory contains "recovered material." In addition, several commenters suggested that EPA expand the definition of "mill broke" and narrow the definition of "waste paper." EPA addresses these issues in the following subsections.

A. Measurement of Recovered Fiber Content

1. Fiber Weight vs. Total Weight

Postconsumer and recovered materials content can be measured in two ways: (1) as a percentage of the total weight of all materials used in a paper or paper product, or (2) as a percentage of the weight of the fiber used in the paper or paper product. The 1988 paper procurement guideline did not recommend a method for measuring recovered fiber content. In response to a 1989 inquiry from the Joint Committee on Printing, EPA stated that content should be measured as a percentage of the fiber weight of the paper. Since then, GSA and GPO have been using the fiber weight method to determine content. Because some states and the Canadian EcoLogo program require total weight calculations, however, some mills remain uncertain about the appropriate approach. In the draft RMAN, EPA's recommended content ranges are expressed by fiber weight. In addition, in section A-6 of the draft RMAN, EPA recommends that procuring agencies establish percentages of postconsumer and recovered fiber content using the fiber weight method.

A measurement protocol based on total weight presumes that all of the materials used to make paper or a paper product can be recovered and accounted for in recovered content measurements. In addition to cellulose fiber, non-cellulosic materials such as clay, calcium carbonate, moisture, dyes, and starches are sometimes used in varying amounts to produce paper. The amount and type of coatings, fillers, and other materials depend on the paper's end use and the chemistry (acid versus alkaline) of the manufacturing process. Fiber, however, is the predominant ingredient in paper and currently is the primary recovered resource of high economic value. Paper processing and deinking technologies are designed to recover and reuse the fiber fraction of paper. While it may be technically possible to recover clay, water, and the other ingredients of paper, currently such practices are not commercially viable in the U.S.

These technical factors make it nearly impossible, using the total weight approach, to certify a paper or paper product as containing 100% recovered fiber even when the only fiber used in the production of the item is recovered fiber. More importantly, a total weight measurement makes it unnecessarily complicated to compare any two grades of paper or paper products because of the

differing amounts of non-cellulosic material they may contain, even if they both use precisely the same type and amount of recovered fiber and are intended for the same end use. This could lead to unintended adverse impacts on waste generation. For example, if a procuring agency uses a heavier, uncoated paper, rather than a thinner, coated paper for a printing application, a greater volume of waste will be generated (assuming that the printed product is discarded).

For these reasons, EPA recommends that procuring agencies use the fiber weight method of calculating postconsumer and recovered fiber content. This method accounts only for the fiber and does not consider the coatings, fillers, and other materials used in the manufacture of paper. EPA believes that the fiber weight method provides a uniform approach for accounting for postconsumer and recovered fiber content in all papers and paper products, regardless of the manufacturing process used and the inclusion of other materials in the sheet.

2. Recovered Fiber Component of Mill Broke

In the 1988 paper procurement guideline, EPA defined "mill broke" as any paper waste generated before the completion of the papermaking process. Because RCRA section 6002(h) defines "recovered materials" as materials generated after the completion of the papermaking process, EPA's 1988 definition of "mill broke" stated that this material cannot be counted toward recovered materials content.

Since then, mills have inquired whether mill broke generated in a papermaking process that uses postconsumer or recovered fiber can be included in content calculations. Other commenters suggested that mill broke that contains postconsumer or recovered fiber should be counted. The 1988 guideline did not address this issue.

The mills and other commenters stated that there are two types of mill broke to consider: mill broke generated in a papermaking process using only wood-based pulp and mill broke generated in a papermaking process using pulp made with some or all postconsumer or recovered fiber. The mills suggested to EPA that broke generated in a process using postconsumer or recovered fiber as feedstock should be considered differently from broke generated by a mill using only wood-based fiber. EPA agrees that such material should count toward "postconsumer fiber" or "recovered fiber" content, although only to the extent that the feedstock contains materials which would qualify as postconsumer or recovered fiber.

All paper mills generate small percentages of mill broke, and this material is commonly repulped. For this reason, use of mill broke does not remove materials from solid waste, and mill broke ordinarily is not considered to be a recovered material. If broke is generated in a papermaking process that uses postconsumer or recovered fiber for feedstock, however, but cannot be counted toward postconsumer or recovered fiber content, then the mill will not be able to account for all of the postconsumer and recovered fiber actually used as feedstock. EPA believes that such an outcome is illogical and presents an unnecessary obstacle to the manufacture of paper and paper products containing postconsumer or recovered fiber. Therefore, in section A-6 of the draft RMAN, EPA recommends that procuring agencies permit mills to count mill broke generated in a papermaking process using postconsumer and/or recovered fiber as feedstock toward "postconsumer fiber" or

"recovered fiber" content, to the extent that the feedstock contained these materials. In other words, if a mill uses less than 100% postconsumer or recovered fiber, only a proportional amount of broke can be counted towards postconsumer or recovered fiber content.

The following examples illustrate how mill broke should be counted:

- A newsprint manufacturer uses 100% postconsumer old newspapers (ONP) as feedstock and generates some mill broke, which is returned to the manufacturing process. All of the mill broke can be counted as postconsumer fiber.
- A manufacturer of printing and writing papers uses pulp containing 50% recovered fiber (none of which is postconsumer fiber) and generates 100 pounds of broke. Because recovered fiber constituted half of the pulp, only half of the broke (50 pounds) should be counted as recovered fiber. In addition, because no postconsumer fiber was used, the broke cannot be counted as "postconsumer fiber."

B. Clarifications and Revisions to Definitions

1. "Postconsumer Fiber"

EPA has been asked whether the definition of "postconsumer" includes printers' over-runs, converters' scrap, and/or over-issue publications. EPA notes that the definition of "recovered materials" in RCRA section 6002(h) differentiates between "postconsumer materials" and materials generated by manufacturers and others, including converters, printers, wholesalers, and retailers. As a result, items such as printers' over-runs, converters' scrap, and over-issue publications are not considered to be postconsumer materials and cannot be counted toward meeting postconsumer fiber requirements.

In section A-7 of the draft RMAN, EPA is using the definition of "postconsumer" found in RCRA section 6002(h) as the definition of "postconsumer fiber." EPA is adding a clarifying statement that fiber derived from printers' over-runs, converters' scrap, and over-issue publications is not postconsumer fiber.

2. "Recovered Materials" Definitions

RCRA contains two definitions of "recovered materials." RCRA section 6002(h) provides a specific definition of "recovered materials" to be used when purchasing paper products. RCRA section 1004 contains a more general definition of "recovered materials" that applies to other procurement items. Because Executive Order 12873 includes the general definition of "recovered materials" found in RCRA section 1004, but not the more specific "recovered materials" definition found in RCRA section 6002(h), procuring agencies and paper mills have asked EPA about which definition of "recovered materials" applies to the paper content levels in the Executive Order.

The Executive Order is a management directive to federal executive agencies. As such, agencies should implement its provisions consistently with applicable federal law. Therefore, federal

agencies and manufacturers should note that the specific definition of "recovered materials" found in RCRA section 6002(h) is the applicable definition to be used for purposes of implementing the content levels listed in Section 504(b) of the Executive Order.

Procuring agencies and manufacturers also should note that, as used in Section 504(b) of the Order, the term "recovered materials" is synonymous with "recovered fiber" as used in the draft RMAN. It includes postconsumer materials and certain preconsumer materials. Thus, the definition of "recovered fiber" found in the draft Paper Products RMAN should be used when purchasing the paper products for which section 504(b) specifies a minimum percentage of "recovered materials."

Procuring agencies and manufacturers also should note that section 504(c) of Executive Order 12873 provides an alternative content standard for paper products containing a specific subset of industrial byproducts. The term "recovered materials," as found in section 504(c), should only be used when purchasing printing and writing paper meeting this alternative standard.

3. "Mill Broke"

In the 1988 paper procurement guideline, EPA defined "mill broke" as follows:

"Mill broke" means any paper waste generated in a paper mill prior to completion of the papermaking process. It is usually returned directly to the pulping process. Mill broke is excluded from the definition of "recovered materials."

Several groups suggested to EPA that the mill broke definition should be expanded to include certain materials that are generated after the completion of the papermaking process, including materials generated in finishing operations. These materials are commonly re-pulped, sold to others for pulping, or otherwise used in or converted to paper products. The commenters argued that allowing these materials to count toward recovered fiber content neither provides an incentive for mills to use materials diverted or recovered from the waste stream nor provides an incentive for mills to invest in the capability to use materials that must be cleaned, deinked, or processed prior to use.

EPA agrees with the commenters that allowing these materials to count toward recovered fiber content does not provide an incentive for mills to use materials recovered from solid waste and, therefore, does not meet the RCRA objective of increasing markets for postconsumer materials. For this reason, EPA believes that these materials should no longer be included in the definition of "recovered materials." In section A-7 of the draft RMAN, EPA is using the following new definition of "mill broke:"

"Mill broke" means any paper or paperboard scrap generated in a mill prior to completion of the papermaking process and/or specific materials generated during finishing operations that occur after the end of the papermaking process. It includes the following materials, whether generated prior to or after the completion of the papermaking process: paper machine trim, offgrade or off-specification rolls (also referred to as rejected, unused stock), culls, stub rolls, side rolls, end rolls, and obsolete inventories of paper and paperboard. Although mill broke is occasionally

sold from one mill to another, such a sale does not alter its classification or exclusion from the definition of "recovered fiber."

This new definition identifies materials that will be considered to be mill broke, regardless of whether they are generated before or after the end of the papermaking process. It also clarifies that a sale of these materials does not change them into "recovered materials."

The specific materials identified in the new "mill broke" definition are paper machine trim, offgrade or off-specification rolls, culls, stub rolls, side rolls, end rolls, and obsolete inventories of paper and paperboard. Some of the materials clearly are generated prior to the end of the papermaking process, such as trim and rejected stock. Others can be generated either before or after the completion of the papermaking process. Examples of these latter materials are off-grade or off-quality paper, side rolls, and obsolete inventory.

Off-grade or off-quality paper has a quality variation which renders it unsuitable for sale as the grade of intended manufacture. EPA has learned that it is frequently sold as a lower grade or as a job lot. Job lot paper contains a defect which the intended customer would find objectionable. This grade is usually sold by a seconds dealer at a lower price, and the purchaser is told of the defect. Side rolls are narrow rolls of paper which are created when paper the width of the paper machine reel is cut into the specific widths ordered by the customer. EPA has been informed that most side rolls have commercial value and are sold as first quality rolls of paper, although some side rolls are treated as off-grade, job lot, or obsolete inventory. Obsolete inventory is finished paper stocked by a mill or merchant which has become unsellable because of changes in trade conditions or because of age.

EPA requests comment on the revised "mill broke" definition.

4. "Recovered Fiber"

As explained in section I.D.1, EPA is substituting the term "recovered fiber" for the term "waste paper" used in the 1988 paper procurement guideline. Like "waste paper," "recovered fiber" consists of fibers from postconsumer materials, preconsumer materials that require cleaning or processing, and certain other unprinted, relatively clean materials generated after the end of the papermaking process.

The term "recovered fiber" is a more appropriate description of the materials used than is "waste paper." Because these recovered materials have value as a feedstock for pulp and papermaking, the Paper Recycling Coalition, an industry group, suggested to EPA that it is more appropriate to refer to them as "recovered" rather than as "waste." EPA agrees that perception of these materials is important to general acceptance of paper and paper products made from them. EPA believes that these materials will gain wider acceptance as a fiber source when mills, paper specifiers, paper purchasers, and end users stop viewing them, and paper made from them, as "trash," "garbage," or "waste."

In addition to the name change, EPA is making three significant revisions to the 1988 "waste paper" definition. First, the definition found in section A-7 of the draft RMAN clarifies that

materials must be repulped, not just recovered, in order to count toward recovered fiber content. Job lotters and others asked EPA whether obsolete inventory or off-specification paper containing no recovered fiber could be converted into products such as writing tablets and sold as recycled products. While EPA believes that this practice is consistent with the Agency's goals of promoting diversion of materials from solid waste, these products are not made from paper containing fibers recovered from recovered materials and, therefore, do not meet the statutory definition of "recovered materials."

Second, consistent with the revised definition of "mill broke," the definition of "recovered fiber" excludes materials such as obsolete inventory or off-specification product generated at mills after the end of the papermaking process.

Third, EPA is clarifying that forest residues do not count toward "recovered fiber" content. Because the introductory phrase to subsection (2) of the 1988 waste paper definition contains the words "forest residues," it was not clear whether the use of forest residues could be counted toward "waste paper" content. It was not EPA's intent that forest residues count toward "waste paper" content. In the draft RMAN, the words "forest residues" are deleted from the introductory phrase to subsection (2) in order to clarify that fiber derived from these materials are not counted toward recovered fiber content.¹⁰

Table 13 summarizes which materials can be counted toward "recovered fiber" content under the new definition.

¹⁰ Section 504(c) of Executive Order 12873 provides an alternative standard for uncoated printing and writing papers made from materials such as sawdust. This provision is discussed in section VI of this document.

Table 13. -- Materials in Recovered Fiber Definition

Material	Counts Toward Recovered Fiber
Postconsumer	Y
Envelope cuttings	Y
Bindery trimmings	Y
Mills' obsolete inventory	N
Converting scrap	Y
Printers scrap	Y
Side trimmings	N
Cull	N
End rolls	N
Mills' stub rolls	N
Butt rolls	N
Mills' rejected, unused stock	N

Following is the revised "recovered fiber" definition:

"Recovered fiber" means the following materials:

(1) Postconsumer fiber such as:

(A) Paper, paperboard, and fibrous wastes from retail stores, office buildings, homes, and so forth, after they have passed through their end-usage as a consumer item, including: used corrugated boxes; old newspapers; old magazines; mixed waste paper; tabulating cards; and used cordage; and

(B) All paper, paperboard, and fibrous wastes that enter and are collected from municipal solid waste.

(2) Fiber derived from printing and converting operations, excluding any paper generated in a paper mill prior to the completion of the paper manufacturing process.

"Recovered fiber" includes repulped fiber from dry paper scrap generated after the paper machine reel has been rewound and/or cut into smaller rolls or rough sheets, including but not limited to:

(A) Envelope cuttings, finishing trim, bindery trimmings, and other paper and paperboard resulting from printing, cutting, forming, and other converting operations; and bag, box, and carton manufacturing wastes; and

(B) Repulped finished paper and paperboard from obsolete inventories of paper merchants, wholesalers, dealers, printers, converters, or consumers.

EPA requests comment on this definition.

C. Recyclability

The underlying purpose of RCRA section 6002 is to use the stimulus of governmental purchasing to foster markets for recovered materials. Therefore, EPA encourages materials recovery to conserve valuable natural resources and to provide alternatives to landfilling and incineration. In order to achieve both of these objectives, EPA believes that procuring agencies should consider the impact of purchases on their recyclables collection programs.

Depending on their fiber or other characteristics, some paper products containing postconsumer or other recovered fiber may have a wider variety of potential markets and, therefore, may be easier to recycle than others. Certain characteristics can lower the value of collected paper or limit its reuse as a feedstock for new products. Other characteristics might require adjustments in an agency's collection program.

For example, office white paper is a highly valued recovered material. Depending on its market, an office white paper collection program might exclude other office papers that are colored, coated, or contain groundwood. Thus, if a procuring agency decided to purchase a colored paper or a paper containing groundwood for office use, the agency should expect that these materials would affect the office white paper collection program. The agency could find that the paper is recyclable, but that (1) the value of the recovered paper is reduced because it is now mixed paper rather than white office paper, or (2) a separate sort is required in order to maintain the value of the white office paper. Alternatively, the agency could find that the paper must be disposed of because there is no market for it in the geographic area in which the agency is located.

Yet other characteristics might make a paper product more recyclable or generate less material because the product is source reduced. For example, manufacturers may be using less packaging or reusable packaging, resulting in less waste.

EPA believes that procuring agencies should consider these impacts prior to purchasing paper products containing postconsumer or other recovered fiber. Therefore, in section A-6 of the draft RMAN, EPA is recommending that procuring agencies consider the effect of their procurement actions on their paper collection programs by assessing the impact of their decisions on their overall contribution to the solid waste stream.

D. Use of EPA's Recommendations

EPA encourages state and local agencies and private sector purchasers to use the recommendations in the draft RMAN when purchasing paper and paper products. EPA recommends that purchasers establish their minimum content standards at the highest percentages available to them, even if these standards are above EPA's recommended ranges.

EPA has found that some state agencies have been using the Agency's 1988 content recommendations as a starting point in establishing product labeling requirements. While EPA's recommendations were not intended for use as labeling standards, they can be used as an information source for agencies establishing recycled product labeling programs.

EPA cautions persons using the Agency's recommendations, whether to establish purchasing specifications or labeling standards, to use them only for the specific items for which they were intended. It is not appropriate to analogize from one item in a paper grade (e.g., printing and writing paper, tissue products, paperboard) to another item that could also fall within that grade, without first researching the use of postconsumer and recovered fiber in the other item. The two items could have different performance requirements necessitating different levels of postconsumer or recovered fiber. In addition, one item could be made primarily by mills that use high percentages of postconsumer or recovered fiber, while the other item could be made primarily by mills that use low or no percentages of this fiber.

VII. SUPPORTING INFORMATION

EPA used the following reports and other information in developing the draft recommendations for paper and paper products. EPA placed these documents in the RCRA docket under docket number F-95-PPRN-FFFFF.

General

"1994 Statistics of Paper, Paperboard, and Wood Pulp," American Forest & Paper Association, September 1994, Tables II, III, IV, VII, and VIII.

"Paper, Paperboard, Pulp Capacity, and Fiber Consumption, 1992 - 1996," American Forest & Paper Association, December 1993, p. 26.

"Final Report on Recycled Paper Definitions, Standards, Measurement, Labeling Guidelines, and Buy-Recycled Initiative," Recycling Advisory Council, February 6, 1992.

"Summary of Public Comments Submitted to U.S. EPA in Response to 10/3/90 Federal Register Notice on the Paper Procurement Guideline," prepared for U.S. EPA by E.H. Pechan & Associates, Inc., January 31, 1991.

"Research on Costs to Track Postconsumer Materials in Recycled Paper," Revised Draft Report, prepared for U.S. EPA by E.H. Pechan & Associates, Inc., June 1993.

Newsprint

"Meeting U.S. Newspaper Publishers' Recycled Content Purchasing Goals: An Analysis of Availability," presentation by Michael Alexander, Northeast Recycling Council, before the Newspaper Association of America, April 27, 1993.

Tissue Products

"Commercial Sanitary Tissue Product Research," Revised Draft Report, prepared for U.S. EPA by E.H. Pechan & Associates, Inc., December 1991.

"New recycled tissue products court consumer markets," Paper Recycler, Vol. 4, No. 11, November 1993.

"Supplementary Sanitary Tissue Research," Final Draft, prepared for U.S. EPA by Eastern Research Group, Inc., August 26, 1994.

Paperboard and Packaging

"Recycled Paperboard Research," Final Draft, prepared for U.S. EPA by E.H. Pechan & Associates, Inc., October 1991.

"Supplementary Paperboard Research," Final Draft, prepared for U.S. EPA by Eastern Research Group, Inc., September 9, 1994.

Letter to Dana Arnold, Office of Solid Waste, U.S. EPA, from Terese Colling, Washington Representative, Paper Recycling Coalition, November 9, 1994.

"Containerboard Research," Revised Draft Report, prepared for U.S. EPA by E.H. Pechan & Associates, Inc., March 1992.

"Supplementary Containerboard Research," Final Draft, prepared for U.S. EPA by Eastern Research Group, Inc., August 31, 1994.

Printing and Writing Papers

Uncoated Printing and Writing Papers

Executive Order 12873, "Federal Acquisition, Recycling, and Waste Prevention," October 20, 1993 (58 FR 54911, October 22, 1993).

Letter to Dana Arnold, Office of Solid Waste, U.S. EPA, from Sara Freund, Manager, Printing-Writing Paper Division, American Forest & Paper Association, July 15, 1994.

"Definitions of Printing-Writing Grades for August 3 EPA Procurement Meeting," Printing-Writing Paper Division, American Forest & Paper Association.

Letter to Dana Arnold, Office of Solid Waste, U.S. EPA, from John M. Evans, Printing-Writing Paper Division, American Forest & Paper Association, August 19, 1994.

Envelopes

"Research on Recycled-Content Envelope Performance Requirements," Revised Draft Report, prepared for U.S. EPA by E.H. Pechan & Associates, Inc., July 1993.

"Supplementary Envelope Research," Final Draft, prepared for U.S. EPA by Eastern Research Group, Inc., August 26, 1994.

Cotton Papers

"Recycled Fiber Use in Cotton Content Paper," Draft Report, prepared for U.S. EPA by E.H. Pechan & Associates, Inc., October 1991.

Letter to Robert Dellinger and Dana Arnold, Office of Solid Waste, U.S. EPA, from Sara Freund, Manager, Printing-Writing Paper Division, American Forest & Paper Association, January 12, 1994.

"Position Paper -- Presidential Executive Order and Proposed EPA Implementation Guidelines," prepared by the Cotton Fiber Paper Manufacturers and the American Forest & Paper Association, January 1994.

Coated Printing and Writing Papers

"Coated Printing Paper Research," Draft Report, prepared for U.S. EPA by E.H. Pechan & Associates, Inc., October 1991.

"Update of Coated Printing Paper Research," Draft, prepared for U.S. EPA by E.H. Pechan & Associates, Inc., December 20, 1993.

Bristols

"Bristols Research," Draft Report, prepared for U.S. EPA by E.H. Pechan & Associates, Inc., December 1991.

"Supplementary Bristols Research," Final Draft, prepared for U.S. EPA by Eastern Research Group, Inc., August 26, 1994.

APPENDIX

Draft Paper Products Recovered Materials Advisory Notice

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Section A-6 -- Other Recommendations for Paper and Paper Products

Section A-7 -- Definitions

Appendix I. -- Example Calculation of Postconsumer Fiber Content of a Corrugated Container

Part A -- Paper and Paper Products

Section A-1 -- Printing and Writing Papers

Preference Program: EPA recommends that procuring agencies establish minimum content standards expressed as a percentage of recovered fiber, including a percentage of postconsumer fiber. EPA recommends that procuring agencies base their minimum content standards for printing and writing papers on the content levels shown in Tables A-1a, A-1b, and A-1c. Percentages are based on the fiber weight of the product.

Table A-1a. -- Recommended Recovered Fiber Content Levels for Uncoated Printing and Writing Papers

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
Reprographic Paper (e.g., mimeo and duplicator paper, high-speed copier paper, and bond paper*)	20	20
Offset Paper (e.g., offset printing paper*, book paper*, bond paper*)	20	20
Tablet Paper (e.g., office paper such as note pads, stationery* and other writing* papers)	20	20
Forms Bond (e.g., forms, computer printout paper, ledger*)	20	20

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
Envelope Paper		
Wove	20	20
Kraft		
White and colored (including manila)	10 - 20	10 - 20
Unbleached	10	10
Cotton Fiber Paper (e.g., cotton fiber papers, ledger*, stationery* and matching envelopes, and other writing* papers)	50	20
Text & Cover Paper (e.g., cover stock, book paper*, stationery* and matching envelopes, and other writing* paper)	50	20
Supercalendered	10	10
Check Safety Paper	10	10

* These items can be made from a variety of printing and writing papers, depending on the performance characteristics of the item. Some of the papers are a commodity-type and some are specialty papers. EPA recommends that procuring agencies determine the performance characteristics required of the paper prior to establishing minimum content standards. For example, bond, ledger, or stationery made from cotton fiber paper or a text & cover paper have different characteristics than similar items made from commodity papers.

Table A-1b. -- Recommended Recovered Fiber Content Levels for Coated Printing and Writing Papers

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
Coated Printing Paper	10	10
Carbonless	20	20

Table A-1c. -- Recommended Recovered Fiber Content Levels for Bristols

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
File Folders (manila and colored)	20	20
Dyed Filing Products	20 - 50	20
Cards (index, postal, and other, including index sheets)	50	20
Pressboard Report Covers and Binders	50	20
Tags and Tickets	20 - 50	20

Section A-2 -- Newsprint

Preference Program: EPA recommends that procuring agencies establish minimum content standards expressed as a percentage of recovered fiber, including a percentage of postconsumer fiber. EPA recommends that procuring agencies base their minimum content standards for newsprint on the content levels shown in Table A-2. Percentages are based on the fiber weight of the product.

Table A-2. -- Recommended Recovered Fiber Content Levels for Newsprint

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
Newsprint	40 - 100	40 - 85

Section A-3 -- Sanitary Tissue Products

Preference Program: EPA recommends that procuring agencies establish minimum content standards expressed as a percentage of recovered fiber, including a percentage of postconsumer fiber. EPA recommends that procuring agencies base their minimum content standards for sanitary tissue products on the content levels shown in Table A-3. Percentages are based on the fiber weight of the product.

Table A-3. -- Recommended Recovered Fiber Content Levels for Sanitary Tissue Products

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
Bathroom tissue		
Commercial/industrial	100	25 - 60
Consumer	20 - 100	20 - 60
Paper towels		
Commercial/industrial	100	40 - 60
Consumer	20 - 100	20 - 60
Paper napkins		
Commercial/industrial	100	30 - 60
Facial tissue		
Commercial/industrial	100	30
Industrial wipers	40 - 100	40

Section A-4 -- Paperboard and Packaging Products

Preference Program: EPA recommends that procuring agencies establish minimum content standards expressed as a percentage of recovered fiber, including a percentage of postconsumer fiber. EPA recommends that procuring agencies base their minimum content standards for paperboard and packaging products on the content levels shown in Table A-4. Percentages are based on the fiber weight of the product.

Table A-4. -- Recommended Recovered Fiber Content Levels for Paperboard and Packaging Products

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
Corrugated containers* (300 psi) (300 psi)	40 - 50 30	40 - 50 30
Solid Fiber Boxes	40	40
Folding cartons**	100	40 - 80
Industrial paperboard (e.g., tubes, cores, drums, and cans)	100	45 - 100
Miscellaneous (e.g., pad backs, covered binders, book covers, mailing tubes, protective packaging)	90 - 100	75 - 100
Padded mailers	5 - 15	5 - 15
Carrierboard	25 - 100	15

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
Brown papers (e.g., wrapping paper and bags)	5 - 40	5 - 20

* The recovered and postconsumer fiber content is calculated from the content of each component relative to the weight each contributes to the total weight of the box. See Appendix I for an example.

** The recommended content ranges are not applicable to all types of paperboard used in folding cartons. Cartons made from solid bleached sulfate or solid unbleached sulfate contain no or small percentages of postconsumer fiber, depending on the paperboard source.

Section A-5 -- Miscellaneous Paper Products

Preference Program: EPA recommends that procuring agencies establish minimum content standards expressed as a percentage of recovered fiber, including a percentage of postconsumer fiber. EPA recommends that procuring agencies base their minimum content standards for the listed paper products on the content levels shown in Table A-5. Percentages are based on the fiber weight of the product.

Table A-5. -- Recommended Recovered Fiber Content Levels for
Miscellaneous Paper Products

Item	Recovered Fiber (%)	Postconsumer Fiber (%)
Tray liners	100	75

Section A-6 -- Other Recommendations for Paper and Paper Products

Measurement: EPA recommends that procuring agencies express their minimum content standards as a percentage of the fiber weight of the paper or paper product. EPA further recommends that procuring agencies specify that mill broke cannot be counted toward postconsumer or recovered fiber content, except that procuring agencies should permit mills to count mill broke generated in a papermaking process using postconsumer and/or recovered fiber as feedstock toward "postconsumer fiber" or "recovered fiber" content, to the extent that the feedstock contained these materials. In other words, if a mill uses less than 100% postconsumer or recovered fiber, only a proportional amount of broke can be counted towards postconsumer or recovered fiber content.

Specifications: EPA recommends that procuring agencies review specifications provisions pertaining to performance and aesthetics and revise provisions that can impede use of postconsumer and recovered fiber, unless such provisions are related to reasonable performance standards. Agencies should determine whether performance provisions are unnecessarily stringent for a particular end use. Agencies also should revise aesthetics provisions -- such as brightness, dirt count, or shade matching -- if appropriate, consistent with the agencies' performance requirements, in order to allow for a higher use of postconsumer and recovered fiber.

EPA recommends that procuring agencies document determinations that paper products containing postconsumer and recovered fiber will not meet the agencies' reasonable performance standards. Any determination should be based on technical performance information related to a specific item, not a grade of paper or type of product.

EPA recommends that procuring agencies watch for changes in the use of postconsumer and recovered fiber in paper and paper products. When a paper or a paper product containing postconsumer and recovered fiber is produced in types and grades not previously available, at a competitive price, procuring agencies should either revise specifications to allow the use of such type or grade, or develop new specifications for such type or grade, consistent with the agencies' performance requirements.

Recyclability: EPA recommends that procuring agencies consider the effect of a procurement of a paper product containing recovered and postconsumer fiber on their paper collection programs by assessing the impact of their decision on their overall contribution to the solid waste stream.

Section A-7 -- Definitions

For purposes of the recommendations contained in this Part, terms shall have the following meanings:

"Postconsumer fiber" means:

- (1) Paper, paperboard, and fibrous wastes from retail stores, office buildings, homes, and so forth, after they have passed through their end-usage as a consumer item, including: used corrugated boxes; old newspapers; old magazines; mixed waste paper; tabulating cards; and used cordage; and
- (2) All paper, paperboard, and fibrous wastes that enter and are collected from municipal solid waste.

Postconsumer fiber does not include fiber derived from printers' over-runs, converters' scrap, and over-issue publications.

"Recovered fiber" means the following materials, excluding mill broke:

(1) Postconsumer fiber such as:

(A) Paper, paperboard, and fibrous wastes from retail stores, office buildings, homes, and so forth, after they have passed through their end-usage as a consumer item, including: used corrugated boxes; old newspapers; old magazines; mixed waste paper; tabulating cards; and used cordage; and

(B) All paper, paperboard, and fibrous wastes that enter and are collected from municipal solid waste.

(2) Fiber derived from paper manufacturing, printing, and converting operations, excluding any paper generated in a paper mill prior to the completion of the paper manufacturing process. Recovered fiber includes repulped fiber from dry paper wastes generated after the paper machine reel has been rewound and/or cut into smaller rolls or rough sheets, including but not limited to:

(A) Envelope cuttings, finishing trim, bindery trimmings, and other paper and paperboard resulting from printing, cutting, forming, and other converting operations; and bag, box, and carton manufacturing wastes; and

(B) Repulped finished paper and paperboard from obsolete inventories of paper merchants, wholesalers, dealers, printers, converters, or consumers.

"Mill broke" means any paper or paperboard scrap generated in a mill prior to completion of the papermaking process and specific materials generated during finishing operations that occur after the end of the papermaking process. It includes the following materials whether generated prior to or after the completion of the papermaking process: paper machine trim, offgrade or off-specification rolls (also referred to as rejected, unused stock), culls, stub rolls, side rolls, end rolls, and obsolete inventories of paper and paperboard. Although mill broke is occasionally sold from one mill to another, such a sale does not alter its classification or exclusion from the definition of "recovered fiber."

Appendix I. -- Example Calculation of Postconsumer Fiber Content of a Corrugated Container

C-flute has a take-up factor of approximately 1.44, which means that for each one foot of combined corrugated board there is 1.44 feet of fluted medium. This factor is used to calculate the weight of paperboard in a given area of combined corrugated board, from which the basis weight of the board is derived. Each linerboard contributes 35% of the basis weight (42/121.4). The medium contributes 30% of the total basis weight (37.4/121.4).

	<u>Board Basis Weight</u> (lbs/MSF)
Linerboard #1	$42 \times 1.00 = 42.0$
Medium	$26 \times 1.44 = 37.4$
Linerboard #2	$42 \times 1.00 = 42.0$
Combined Board Weight	121.4 lbs/MSF

If the linerboard used has 20% postconsumer fiber and the medium has 80% postconsumer fiber, the resulting total postconsumer fiber content of the containerboard is as follows:

Linerboard: $.35 \times .20 = .07 \times 2 = .14$ (or 14%)

Medium: $.30 \times .80 = .24$ (or 24%)

Total postconsumer fiber: $.14 + .24 = .38$ (or 38%)

