
The Environmental Paper Listening Study

Chapter Two: Recycled Content Paper Question 26a: Does Recycled Paper Perform Competitively in Office Machines?

**Prepared by
CONSERVATREE
Susan Kinsella
Gerard Gleason**

**in collaboration with the
RECYCLED PAPER COALITION
Darby Hoover
Jodi Cahillane**

June 11, 2003

<http://www.PaperListeningStudy.org>

Conservatree
Attn: Susan Kinsella, Gerard Gleason
100 Second Avenue
San Francisco, CA 94118
415/721-4230
paper@conservatree.com
<http://www.conservatree.com>

Conservatree is a nonprofit catalyst and advocate for ecologically sustainable paper markets, combining environmental commitment with paper industry and technical proficiency. It provides practical tools and realistic strategies for successful conversion to environmentally sound and sustainable papers.

Conservatree began in 1976 as the for-profit Conservatree Paper Company, specializing in identifying, developing and supplying commercial quantities and qualities of cutting edge recycled printing and writing papers. After the company closed in 1997, Susan Kinsella and Gerard Gleason converted its information and advocacy mission to an independent nonprofit project of The Tides Center. It does not sell paper, does not represent any paper company or distributor, and networks with people with all types of perspectives on environmental paper issues.

As director of the Listening Study, Conservatree creates partnerships, conducts interviews, researches reports and tests, oversees the comprehensiveness of the information, writes the synopses, and compiles the reports.

Recycled Paper Coalition
Attn: Darby Hoover, Jodi Cahillane
c/o Acterra: Action for a Sustainable Earth
3921 East Bayshore Road
Palo Alto, CA 94303
312-795-3739
rpc@papercoalition.org
<http://www.papercoalition.org>

The Recycled Paper Coalition (RPC), a voluntary organization of major paper users, strives to conserve natural resources and reduce waste by purchasing environmentally-preferred paper products and by using paper products more efficiently. The goal of the Coalition is to encourage paper recycling and stimulate demand for recycled paper products made from postconsumer materials.

The Coalition drew up its charter in 1992 and today there are over 270 members, including such corporations as Warner Bros., Texas Instruments, Levi-Strauss (The Americas), and Ford Motor Company. The RPC's National Board of Directors includes Bank of America, Kaiser Permanente, Pitney Bowes, the Natural Resources Defense Council, the California Integrated Waste Management Board, Hewlett-Packard, Norm Thompson Outfitters, The City of Chicago, RR Donnelley & Sons Company, Environmental Law & Policy Center, the Alameda County Waste Management Authority and Source Reduction and Recycling Board, Corporate Express, American Product Distributors, and the Walt Disney Company.

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Environmental Paper Listening Study: Recycled Content Paper

Question 26a: Does Recycled Paper Perform Competitively in Office Machines?

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PROJECT OVERVIEW

THE LISTENING STUDY

Questions about environmental printing and writing papers have proliferated over the past 15 years or more. Arguments about some of the issues have been intense and often contentious. On some issues, industry and environmentalists have become deadlocked and purchasers have become confused or uncertain about the “right” answers to guide them in their paper choices. In too many cases, this has resulted in no progress at all.

What if, instead, there were a place for everyone to discuss these issues in a respectful, thoughtful, candid and objective way? What if each of us were able to step back, take a deep breath, and *listen* . . . Get a better idea of the whole, multi-faceted complexity of each issue. Hear what’s behind each argument and understand better why each side holds fast to it?

What if paper purchasers and environmental paper advocates could get the benefit of the latest know-how from paper and equipment manufacturers, printers and other paper experts – conversations many otherwise have little access to? What if purchasers and industry representatives could see the in-depth research and thinking behind many of the environmental arguments? What if all of us had a place where we could truly “*listen*” to each other without feeling that that jeopardized our own position?

That is the purpose of the Listening Study. Questions of environmental impacts, technology and production are too big, too complex, and have too many effects on the larger society to be decided by only one side of an argument. Rather, and especially with arguments as rancorous as many have been within environmental paper issues, each side generally has a piece of the truth. Success only results from finding a way to put those pieces together.

In order to see what each of these pieces of the truth is, in order to start putting them together, in order to find a way to resolve them, we need to lay out all the different aspects and arguments, with value and respect for each, so that all of us are on the same – very large – page. Then we can begin to make sense of it all and find a way through.

Providing that kind of “place,” facilitating that kind of dialog, is the purpose of the Listening Study, a project of the nonprofit advocacy organization, Conservatree. Funded by a grant from the U.S. Environmental Protection Agency, the Listening Study is being carried out with help of nonprofit research collaborators such as the Recycled Paper Coalition, Fiber Futures, and INFORM.

What the Listening Study is:

- A representation of the broad range of perspectives on many of the most contentious arguments or questions regarding environmental papers today,
- An opportunity for all sides to “listen” to the others, to hear why opponents believe their point of view cannot be ignored,
- A place for laying arguments on the issues “side-by-side” so that each proponent has a more complete understanding of others’ thinking, especially some of the nuances that often escape notice,

- A potential for unraveling and discussing “knots” - arguments that have become so heated they’re almost “black holes,” with each side frequently unable to hear the others,
- A belief that rational presentation of views and perspectives will help sift through opposing arguments to find reliable foundations for building resolution,
- A belief that many of those interested in these questions have not had sufficient access to the wealth of knowledge and studies that underlie perspectives on many of these questions.

What the Listening Study is not:

- A popularity contest. A position stated by many respondents suggests that it is widespread and essential to consider in any deliberations, but it does not automatically mean it is the “right” one,
- A definitive study pointing to the “right” answer. In fact, the “right” answer might turn out to be a composite of two or more listed here, or something that no one has yet identified.

Goals of the Listening Study:

- Provide as complete a picture as possible for each issue, in order to get everyone "on the same page" about how others are thinking and why they’re arguing their points,
- Pinpoint where the obstacles are to environmental paper development and clarify what steps could to be taken next towards either resolution or more resolution-oriented discussions between parties affected,
- Develop more paths of communication between those with differing opinions,
- Develop consensus on specific issues when possible,
- Catalyze research, technical development, education programs and discussions to help resolve issues and move environmental paper development forward,
- Provide thorough data sets for discussing issues,
- Get people talking about environmental paper issues,
- Let people hear the whole conversation – most don’t have the opportunity to ask all these questions of people at paper mills, printers, environmental groups, and more.

CAVEATS

- Statements in Listening Study compilations reflect beliefs, opinions, experience and expertise. In some cases, the technical statements conflict. Even these differences are important. Much of the technical information in the Listening Study is cutting edge. Still, some statements may represent information that others consider debatable or inaccurate, some statements may represent outdated but still cited studies (although older studies may well still represent currently reliable information), some may change with new information, and some may be addressing different aspects of similar questions. These differences are

important to record as part of sorting out what information needs to be clarified. Readers should evaluate technical statements by date (when relevant and available), by source and by comparison to other information available, as well as recognize that there may be a need for more definitive technical information on some questions.

In particular, readers should keep in mind that this is not a study to determine ultimate answers. Rather, it intends to lay out the wide range of perspectives, knowledge and beliefs that must be taken into account in order to answer or resolve the questions. Please read the whole presentation on a question in order to evaluate as complete a picture as possible.

- If you find that a point, perspective or information is missing, please provide it to us, or let us know who could provide it.
- Some quotes are identified only by the respondents' relationship to the question – what specific type of manufacturer or service company they may be from, or what type of office they work in. This is because some respondents could not provide public comments on behalf of their organization, or in some cases because they are providing public comments on behalf of their organization. The Listening Study is focused on representative perspectives on these issues, not on individuals or specific companies. Therefore, we believe that even those quotes that are not publicly identified are valuable because they represent a point of view that is undoubtedly shared by many more as part of the concern under discussion. We provide as much identification as respondents are willing to approve, in order to give readers as much information to assist in their evaluation as possible. This covers the range of some respondents approving full inclusion of names, titles and organizations, to others wanting only their organizations identified, to others wishing only their work sector to be identified. All are appreciated.

PLEASE JOIN THE LISTENING STUDY DISCUSSION!

E-mail Listen@conservatree.com

PURPOSE OF EXECUTIVE SUMMARY SYNOPSIS

The original Listening Study plan called for simply listing all the responses we received to each question. But as we collected more and more answers from people, we realized that many, if not most, readers would appreciate a synopsis of what these responses reveal. Most people are unlikely to read through 40 or more pages of discussion and answers for each question. The challenge, though, is to present the information contained in the responses in as unbiased a manner as possible.

Of course, the original responses are also included, for those who want to make their own evaluations. In fact, we encourage people to read through the entire collection of responses. There is a wealth of information in them, and no synopsis can do them justice.

We expect the publication of this report to elicit more responses on this question, as readers realize that information has been left out, or some responses need to be given more weight, or discussions need more clarity. We regard it as an initial draft, and welcome your comments and additions. This current executive summary, therefore, is likely to change in future editions of this report as more information is added. We will publish new reports as additional comments are received that change or enhance the information here. Each edition will be dated so that readers can identify the latest edition.

EXECUTIVE SUMMARY

One of the longest-running debates in environmental paper development is whether recycled paper works well in office machines or not. Even now, nearly 30 years after commercial grades of recycled papers began to be promoted (they had existed for decades before that but not been identified separately from virgin papers) and 15 years after the first brand of recycled paper was introduced specifically for use in high speed copiers, the debate shows no signs of letting up. While much of the discussion centers on copiers, office printers and faxes figure in, as well. The comments and interview responses we have received in the Listening Study offer new information and some possible paths towards resolving this issue. Ultimately, end-users need to be satisfied with recycled paper's performance in office machines or they will not support their paper purchasers' choices.

A large number of respondents in this initial report are from government agencies, primarily because many of their purchasers are more easily accessible on environmental purchasing listserves than other types of purchasers, and because governments most visibly took the lead in using recycled paper early in its development and continue to do so. It also appears that purchasers in government may be more closely focused on their organizational policies than many purchasers in businesses, who may more often see policies as a step removed from their organization's core business. Nevertheless, this initial report does include respondents from businesses and we would like to include more, to explore whether there are differences in their experiences with environmental papers.

Many users report experiencing no problems using recycled paper in their office equipment. Comments such as, "Yes, it performs competitively in office machines (public agency)," and "The County has been using recycled paper for over 15 years. To the best of my knowledge, we have had no problems with the use of recycled paper in any of our machines (Dane County, WI)," were common. Some respondents listed a wide variety of equipment with which they are successfully using recycled paper. Pennsylvania's Dept. of Environmental Protection even added, "We have been using recycled paper for more than nine years and we have not experienced any difficulty in running recycled paper; for us it was just the opposite, it was virgin paper that caused us major problems."

A number of controlled tests have indicated no difference in performance between recycled and virgin office paper. One was conducted by the U.S. Conference of Mayors (1998) with Cannon, Hewlett-Packard, Lexmark and the U.S. Government Printing Office testing over 2 million sheets of paper on a wide variety of copiers, laser printers and ink jet printers. Recycled paper with 30% postconsumer content performed equivalently to papers with 20-25% postconsumer and to virgin papers. Ongoing testing is reported by Buyers Laboratory, Inc., an independent office products testing laboratory, which has for many years used recycled as well as virgin paper in all its tests of different brands of copiers. It reports "no noticeable difference in the runnability of recycled paper versus virgin paper."

Sometimes, though, it was clear that even respondents who have no problems now with recycled paper have had problems in the past. These include comments such as, "No problems experienced in the past 5 years (Bank of America)," and "In the early 1980s, recycled papers were still in the development phase, and some state agencies in Minnesota had some trouble using the paper in their machines (Minnesota Office of Environmental Assistance webpage)."

Another large group of respondents, however, report still experiencing difficulties with the runnability of recycled paper in their machines. We gathered end-users' comments first so that

we could then take them to equipment manufacturers, paper manufacturers and copier service technicians for their insights into the source of these criticisms.

Those end-users who reported problems with recycled paper described a number of issues. Following is a listing of the types of issues raised, with comments by technical experts when relevant:

- Concern that use of recycled paper would void warranties on copiers and office printers. We interviewed a wide range of copier and printer manufacturers (some of their interviews are still in process and not yet included here) and every one stated that the use of recycled paper would not void the warranty on their machines. One end-user, in a background conversation, told us he had relied on Hewlett-Packard's notation on their website that they did not recommend the use of recycled paper, but about the year 2000 it was removed. Today, Hewlett-Packard's representative says, "There may have been something early on in our warranties pertaining to recycled, but that is definitely not true today." In fact, Hewlett-Packard even sells some recycled copier/office paper under their own brand name.

Other than that reference, we have not received any verification from any source that supports the apparently common belief that using recycled paper will void warranties, and we have received assurances from many equipment companies that it does not. If there is contradictory evidence, we would like to add it to this study.

In fact, some equipment manufacturers were positive about using recycled paper - "[O]ur official contract information says our machines produce satisfactory copies on recycled paper," "Virtually all the recycled papers out there are indiscernible from virgin: they're dust-free, acid-free, etc. (Hewlett-Packard)," and "Our parent company is committed to using recycled products and recycled paper (Savin)." Others said they make no distinction between using recycled or virgin paper. Some have developed lists of recommended papers for their equipment, which they say include specific recycled papers.

One of the most frequent distinctions made about papers by representatives of copier equipment manufacturers was the need to use high quality papers, whether they are virgin or recycled. Representative comments include, "Warranties are more performance-based" and "We believe that low-quality recycled papers, just like low-quality virgin papers, cause runnability problems in copying and printing equipment. We also know that it is possible for recycled papers to achieve the same performance and reliability levels as comparable virgin papers (Xerox)."

Some purchasers, such as those in California and Massachusetts state governments, require that successful copier equipment bidders or contractors guarantee that their machines will perform successfully with recycled paper such as those brands they purchase, in order to assure no warranty issues. Kinko's reports that, "Our environmental assessment of the copiers we use asks if the machine has been designed to use recycled paper; they all are."

All of the office paper manufacturers report that their recycled paper meets the same specifications and performs equivalently to their virgin papers.

- Belief that recycled paper jams more often than virgin papers. The *Paper Task Force Report*, published by the Environmental Defense Fund in 1995, found that, "Frequency of copier machine jams is not correlated with the use of recycled-content paper. The majority of

jams are a function of several factors, such as two-sided copying, the speed and condition of equipment, the quality of the paper being used ([no matter] whether it is recycled or virgin) and operator errors."

One copier manufacturer ascribed problems to "environmental issues" such as low or high humidity, and several respondents noted the importance of reducing paper's exposure to humidity, no matter what the content.

As another copier manufacturer noted, "Bad recycled paper can dust and misfeed – although this is true for bad virgin paper as well and isn't necessarily due to the recycled content." Most of the problems cited fell into the categories described below.

Boise Paper Solutions points out that machines interact dynamically with paper, and that, "Our experience is that a machine will get 'accustomed' to a paper over time. . . . If customers are switching back and forth between virgin and recycled papers, there may be jams – but not necessarily caused by the recycled fiber, per se. It may just be the machine needs to acclimate to the new paper, and once it settles in, the high performance returns."

- Belief that recycled paper curls more often than virgin papers (thus contributing to the paper jams described above). Some respondents found that recycled papers tend to curl more than virgin papers. For example, Savin reports, "Most of the problems we have encountered with higher postconsumer content papers relate to increased curl – the shorter fibers cause the paper to curl more frequently in the heat of the copier process." The Recycled Products Purchasing Cooperative says they "addressed the problem by reducing the heat setting on the printer."

Xerox points out, "The problems of excessive curl and contamination are quality issues related to the paper manufacturing process. Recycled papers, just like virgin papers, vary from high- to low-quality in terms of print quality and runnability. Producing a quality paper requires papermakers to establish strict performance specifications and to control the variability of the papermaking process to meet these specifications consistently."

This is exactly what paper manufacturers say they do. When there are problems, says Cascades Fine Papers, "then the manufacturer has to go back to the drawing board and perfect the product. We have done that and we have not run across any of these problems for many years. Whether you run into these problems really depends on the manufacturer and how they have evolved in their knowledge and experience in making the product." Most other paper manufacturers make the same point.

Weyerhaeuser adds, "Curl is complex and is mostly related to fiber orientation [on the papermaking machine], moisture content and drying strategy. Fiber furnish, including recycled content, tends to be a minor factor in poor sheet curl performance." According to International Paper, "The curl in paper containing recycled fiber has more to do with the hardwood to softwood ratio, the 'cutting' and 'brushing' of the fibers, the alignment of the fibers and the drying of the sheet during manufacture than the actual recycled content. Short fibers, either hardwood or those made by chopping up the long softwood fibers, produce a sheet with better formation but increases post-image curl. A very delicate balance must be maintained between fiber lengths, amount of filler, fiber processing and drying to produce a low curl high formation sheet."

Grays Harbor Paper brings in another point: "Curl of paper is more due to unequal top to bottom fiber distribution during the forming process, and unequal top to bottom drying of

the paper," and Domtar explains, "Optimum fibre length is only one of the parameters required to having a curl free sheet. Excessively long fibre can be detrimental to curl due to the fact that softwood fibres (long) typically have higher coefficients of moisture expansion. It is more important to strive towards top and bottom sides of the sheet that are similar in structure and composition. This will ensure that the shrinkage of the fibres on the topside of the sheet will be more or less equal to the shrinkage of fibre on the bottom of the sheet, thus minimizing curl during toner fusing."

There may be an historic aspect to this issue, as well. International Paper points out that, "In the past, a higher amount of groundwood content was used in the recycled process. It has been determined that it is necessary to keep the groundwood content minimal to control post-image curl. Again, it is important that customers are basing their opinion on recycled grades now available and not on experiences gathered years ago."

Many people experience more jamming and curl when trying to duplex. But Domtar notes that there is actually a positive aspect to curl, if it is used constructively: "One often-overlooked means of improving duplexing is simply to ensure that the paper is loaded with the correct side up in the feed tray. Paper makers induce a certain amount of curl in the sheet, which opposes the stresses imparted to the sheet in the fuser section of copiers."

- Belief that recycled paper creates more dust in office machines than virgin papers. Dusting was the biggest complaint. End-users and some copier equipment manufacturers reported more dust from recycled than from virgin paper. But others, including paper manufacturers, point to sources that are the same no matter whether the paper has recycled or virgin fiber.

Some pointed out inadequate vacuuming of the sides after large sheets and rolls of paper are cut down to 8.5x11 "cut-size" sheets. When this occurs, it is an individual papermill problem, not a recycled content problem. International Paper agrees, "Most of the paper dust causing this problem can be related to finishing problems such as poor edge cuts and rough edges. These are housekeeping and maintenance problems that are independent of the recycled fiber content of the grades." Georgia Pacific adds, "Dusting in end-use devices is generally related to sheeter cut/off quality, slit quality issues or dust removal system deficiencies. It may be influenced by total filler content or choice of surface treatment, but no more so for recycled papers than for virgin papers."

The "total filler content" brings up a point that many end-users may not be aware of: Papermakers have switched over the past several years from acid-based papermaking to alkaline-based production. The reasons are varied, but Badger Paper Mills names two when it says, "[A]lkaline paper allows for brighter and longer lasting paper." Savin says, "An alkaline-based sheet requires less harmful chemicals, and is better for the environment, but an alkaline sheet accepts or absorbs more chalk and fillers in the papermaking process. That chalk residue sticks to the sheet after cutting, and is still on the sheet when it is fed into the copier, which contributes to a greater dusting factor. Dusting is more about alkaline vs. acid than about fiber content."

Domtar lists several possible culprits: "Poorly bound fibre/filler, inadequate surface sizing, excessive filler, poor cut quality during converting, poor internal sizing chemistry (ketone migration)."

Nevertheless, Cascades Fine Papers insists, "There should not be any reason for dusting. You can compensate for this, you can perfect the product. We have not run across any

problems with dusting for the past 5-7 years. The answer is better sizing to seal the paper better and compensate for any dust that could come from an alkaline paper. But this issue is the same for recycled or virgin alkaline sheets. You have to size the paper perfectly."

Océ-USA is convinced that dusting is an historical problem. While several years ago the recycled paper they tested did generally have more dusting than virgin paper, they add, "However, this was several years ago; I think recycled content paper has improved a lot since then."

But an internal university study of 100% postconsumer paper in printers found that the paper they tested caused considerably more dust, wore out rollers faster, and jammed almost twice as much as 100% virgin paper.

End-user responses also suggested a number of auxiliary issues:

- Some machines just seem to have problems when others of the same type do not. One respondent humorously suggests that some machines just have "ghosts" in them. Boise Office Solutions, in a comment above, says they find that sometimes machines just need to get acclimated to the paper. This seems to be borne out by Pennsylvania DEP's experience that they had all sorts of problems with *virgin* paper when they temporarily changed from their usual recycled.

Kinko's, too, reports having problems with a particular 100% postconsumer paper that jammed frequently in their high-speed copiers, even though some branches, presumably using the same types of machines, use only 100% postconsumer in their high-speed copiers and don't experience any problems at all.

- Persistence of historic experience and issues of perception. Many of the comments refer to problems that happened years ago. Both the copier equipment and the paper manufacturers, as well as many end-users, acknowledge past problems but are convinced that today's recycled papers are vastly improved and do not cause those problems now. Georgia Pacific, for example, noted that, "In the early 90's some suppliers experienced difficulty with 'sticky' content that led to contamination of photo receptors until fiber recovery technology improvements resolved the problem." Several paper manufacturers note that they have learned over the years to compensate for weaknesses presented by recycled fibers, as well as maximize to their strengths, just as they must do for each different type of tree fiber they might use, as well.
- Difference in experiences with various brands of recycled paper. As one copier manufacturer stated, "In copiers in general, not just ours, some recycled papers perform better than others." We identify the papers that respondents were happy with, and do not identify the papers that they had problems with, because there was no consistent pattern for either of these. For every complaint about a particular paper, there is another comment that using that specific paper solved someone else's problems. Since this is not a controlled study, we did not want to give the impression that a particular paper is more problematic than another just because it is mentioned more often. We know that the high percentage of government purchasers responding to the Listening Study (which we greatly appreciate) tend to favor certain papers over others because of buying groups and joint contracts, so they are likely to be mentioned more in these comments. However, even so, the same papers listed as causing tremendous problems in one office are named as the salvation for another.

Perhaps the best advice, which several people offered, is to try another recycled paper if one seems to be creating problems, rather than switching immediately to virgin paper. Almost all the problems named by respondents were convincingly explained as potentially common to both virgin and recycled paper by many of the technical respondents. If recycled content truly is not the culprit causing problems, then many should be solvable by switching to a different recycled paper.

- Difference in experience between using 100% postconsumer copy paper vs. papers with lower recycled contents. A number of comments seemed to suggest that problems were more common with 100% postconsumer papers than with 30% postconsumer, but this was not consistent.

Savin reports, "30% postconsumer is a much better paper than the previous paper specified by the government (50% recycled, 10% postconsumer). 30% is an acceptable level of postconsumer content - higher content is problematic," and Cascades Fine Papers says, "Our experience is that very high percentages of recycled fiber can create a higher incidence of copier machine jams because recycled fibers are weaker than the equivalent virgin fibers. You don't see that with 20-30% recycled content. The higher amount of recycled content is more likely to result in a higher incidence of jams on complex processes, such as duplexing. On simple processes such as simply copying, even the 100% recycled is fine. Still, there are ways to compensate for weaker fibers in the manufacturing process."

Nevertheless, Badger's Envirographic 100 is praised by many offices, and Boise Office Solution's Aspen 100 has tested very well in Buyers Laboratory tests. More information is needed, including on the other 100% postconsumer copy papers, to determine whether the postconsumer content seems to play a part in jams and other problems.

- Difference in experience with older, newer or high speed equipment. Grays Harbor Paper says that, "Higher speed equipment is always more susceptible to runnability problems, regardless of recycle content. Our experience with 30% PC recycled paper is that it runs as well as virgin. Older equipment often have runnability problems with recycled and virgin copy paper." Some say that new copiers tend to be designed with simpler paper paths, which reduces jamming. However, high speed copiers tend to be more complex and also hotter, which can be more demanding on the paper.
- Use of old paper or the wrong grade of paper for the machine. Some comments make clear that people are using old paper, which is likely to have absorbed humidity whether the content is recycled or virgin. Paper that is several years old is also unlikely to have been made with today's newest technical advances. Comparing it to new paper makes it impossible to distinguish whether problems are caused by the paper's content, or the difference in age between the papers.

There is also some indication that people are comparing dissimilar types of paper. A text or cover sheet will perform differently from a paper engineered for use in a copier, and those differences are independent of whether or not the paper has recycled content.

- Perception that copier service technicians are often negative about the use of recycled paper. Along with dusting, perhaps the largest number of comments has to do with negative attitudes towards recycled paper that respondents have observed in copier service technicians. Indeed, Canada's Aurora Institute, in the report they are authoring with Reach for Unbleached, *Following the Paper Trail* (to be released later this summer),

finds that, "While at least 40% of respondents had heard no complaints about recycled/chlorine free papers in the office environment, of those who had heard critiques, fully 43.5% of complaints had come from office machine maintenance technicians or distributors."

We interviewed representatives from five companies that service copiers. Three seemed well-informed about and positive towards recycled papers, but two said they discourage its use. One even said he had been warned twenty years ago to stay away from recycled paper and has passed on that advice ever since. We assume that these comments represent a true range in service technician approaches, but we do not believe they are a fair representation of this whole field. We would like to get more input from copier service companies.

No summary can do justice to the wealth of information to be found in the comments in this study. We urge you to read through them to get the full range of knowledge they can provide. We found them fascinating and enlightening.

So far, the comments we have received raise the following questions in determining paths towards resolution:

- 1) Would concerns about using recycled paper in copiers and other office equipment be reduced if paper users received more education about the high quality of today's recycled office papers?
- 2) Would concerns be reduced if paper users were encouraged to separate "old experience" from their current experience with recycled papers?
- 3) Do copier and printer service technicians have knowledge about specific problems caused by recycled paper that need to be addressed?
- 4) Would concerns about using recycled paper in office equipment be reduced if copier and printer service technicians were given more education about today's high quality recycled papers?
- 5) Since service technicians are often an important source of education for paper users who have problems with their office machines, would educating the service technicians also help educate paper users?
- 6) If education of service technicians would be beneficial, who is the best source of that education – the equipment manufacturers who outsource equipment service, recycled paper manufacturers, a combination, other?
- 7) Do 100% postconsumer copier papers compromise performance under any, or special, circumstances, especially duplexing? If so, can the problem be corrected through adaptations in the production process or in office machines?
- 8) Why does dusting seem to be noticed more with recycled papers than with virgin papers, if indeed the problem is potentially the same for both?

**What processes do you think could resolve
the concerns on this Listening Study question?**

QUESTION 26A:

**DOES RECYCLED PAPER PERFORM COMPETITIVELY
IN OFFICE MACHINES?**

We discovered that there is a significant controversy about using recycled paper in office equipment, especially copiers. We pursued a series of responses specifically for these machines.

END-USERS

LISTENING STUDY: Many users experienced no problems running recycled paper in their office equipment, although in some cases they had experienced problems in the past.

"No problems experienced in past 5 years." – Bruce Lawrence, Bank of America

"Yes, it performs competitively in office machines." – (public agency #9)

"We use recycled paper where I work and I haven't heard of any problems associated with it." – (public agency #6)

"The County has been using recycled paper for over 15 years. To the best of my knowledge, we have had no problems with the use of recycled paper in any of our machines." – John Reindl, Recycling Manager, Dane County, Wisconsin

"Our office switched to the Badger Envirographic 100% postconsumer paper last year. Our facilities people performed several tests on the paper (in high speed copiers, regular copiers and printers, etc) and found no problems and we haven't had any problems using it." – Mike Giuranna, federal government employee

"[Our state] offers Envirographic 100 on our state term contract and we are having good results. In blind tests this product actually performed better in copiers and printers than [a competitive 30% postconsumer copier paper]. Now we just need to get people to buy it!" – (public agency #13)

"Various agencies in Charleston are using the Envirographics 100 paper with great results. It performs well in all types of equipment, and we even use it a second time, so to speak (when a page has been printed on one side, we re-insert the paper and use the blank or second side as well). I have researched various papers using the following criteria:

1. highest post consumer content
2. no chlorine/chlorine derivative
3. no old growth timber content
4. mill in substantial environmental compliance
5. performs in equipment
6. cost per ream is competitive

The Envirographics 100 product met all criteria." – Marcella Guerriero, The Lowcountry Environmental Education Program (LEEP), Charleston, SC

"In 1999, our office investigated several printer/copier papers for both recycled content and process chlorine discharge. The goal of our study was to select a new paper for use in our own offices (more than 2,000 people). The initial investigation led us to Rolland's New Life DP100.

We tested 20 reams by running the paper through 20 of the office's printers, copiers, and fax machines (large and small, old and new). The paper worked beautifully with only 1 jam reported - not necessarily caused by the paper. Our organization's offices then used this paper exclusively without problems." – public agency #15

"In Minnesota, purchasing recycled paper is a priority. The state's Central Stores has sold recycled copy paper for years. Their experience with new recycled copy papers has been excellent. Recycled papers are virtually indistinguishable from their non-recycled counterparts, with similar performance, color and cost.

The U.S. Government Printing Office (GPO) maintains a list of qualified high-speed recycled copy papers that met stringent specifications. Those specifications include a minimum of 30% post-consumer recycled fiber, being free of lint and fuzz, and having not more than one paper-caused jam per 5,000 continuous copies.

Great White paper has performed well in Minnesota. It has been the main recycled copy paper for the state for the last few years.

Envirographic 100 (Badger Paper) is a new product at Central Stores. Last summer, several Minnesota agencies tested the paper and found that it performed well in all kinds of office equipment, including high-speed and desktop copy machines, laser printers and fax machines." – Minnesota Office of Environmental Assistance webpage, <http://www.moea.state.mn.us/lc/purchasing/copypaper.cfm>

"In the early 1980s, recycled papers were still in the development phase, and some state agencies in Minnesota had some trouble using the paper in their machines. Common complaints included excess amounts of paper dust (linting) and more frequent paper jams. As a result, some agencies stopped buying recycled paper.

As recycled papers have improved, many offices are giving recycled-content papers another try. The Minnesota Department of Transportation (Mn/DOT) is one such example. Mn/DOT had changed over to recycled paper in their laser printers and low-speed copiers, but chose to use non-recycled (virgin) paper in high-speed copiers like their Xerox DocuTech. In the summer of 1999, Mn/DOT re-examined this practice. They tested Union Camp's [now International Paper] Great White recycled copy paper in their high-volume machinery. A single machine was monitored over a 10-week period; nearly 120 cartons of recycled paper were run through the machine. Kay Tkachuck, Reprographics Unit Supervisor, says, 'The copier using recycled paper continued to operate the same as the other machines still running virgin paper.' As a result, all of the DocuTech machines now run recycled paper." – Minnesota Office of Environmental Assistance webpage, <http://www.moea.state.mn.us/lc/purchasing/copypaper.cfm>

"Massachusetts has been purchasing only recycled paper from our state contract since 1994. Hammermill Savings DP [now discontinued] and Great White used to be the primary brands and both were great. Later, the awarded vendors also added Georgia Pacific-Geocycle and Domtar-Windsor as two other copy paper options. Now, in addition to Great White and Domtar Recycled, we also carry Fore MP [the Hammermill DP replacement], Plainfield, Springhill, IBM Recycled, Wausau Multipurpose, and Rolland New Life Repro. All products meet the federal standards as well for post-consumer content.

Concerning the dust issue, we have not heard of an "actual problem" involving either of these papers from using agencies. What we do hear is that the service reps/technicians from the equipment manufacturers (e.g. copier and printer equipment in particular) are the ones telling users that the recycled paper creates dust. Their information - in our opinion, which is based on our experiences over the years - is derived from their experience with the groundwood products of "days gone by" that did in fact cause problems. We eliminated those products from our state contract back in 1995 - shortly after the complaints started coming in. Since then, we require that all our paper on contract meet the same specifications as virgin (e.g.

same brightness, acid free archival quality, smoothness, etc.). This then allows us to turn around and require our equipment reps on that contract to agree (in the contract terms and conditions) that the papers on the MA State contract are totally compatible with their equipment, will not void warranties, etc.

It doesn't solve the problem completely, but it makes an impact. The tough part is getting the message to the ever changing staff of service reps." – Marcia Deegler, Environmental Purchasing Program Manager, Commonwealth of Massachusetts Operational Services Division

"The Department of Environmental Protection's Central Office Duplicating Shop in Harrisburg, PA has three Xerox Docutech high volume copiers that use at least 30% post consumer content paper. In fact after these Docutechs were delivered and set up in our Duplicating Shop, they have not been exposed to any virgin paper. We have also run recycled sheets that contain 50% PC, 70% PC and 100% PC on this equipment with excellent results. On this equipment our average impressions run around 1.5 million per month; this includes single as well as double sided copies.

In addition to the high volume copiers listed above, DEP Central Office has numerous floor copiers, 915 networked PC printers, as well as numerous fax machines that all use 30% post consumer content paper and we have not experienced any difficulty caused by using recycled paper. Average monthly usage of 8 -1/2" x 11" recycled paper on this equipment is 750,000 sheets.

We have been using recycled paper for more than nine years and we have not experienced any difficulty in running recycled paper; for us it was just the opposite, it was virgin paper that caused us major problems. Approximately 3-1/2 years ago (at that time we were using paper with a 20% post consumer content) our vendor could not furnish us any recycled paper for one month and instead supplied us with a shipment of virgin paper which resulted in numerous service calls due to major paper jams on floor copiers." – Bonnie Shenk, Department of Environmental Protection, State of Pennsylvania

"For the 30% recycled paper, there is no difference between it and virgin paper. When you use the standard photocopier paper, our end users can see absolutely no difference between that and the virgin paper. At one time with the 30% recycled paper, there used to be a lot of dust or fluff that comes off the paper and it used to do harm to the machines – clog them up and dirty them. The paper that's produced today is equal to or better than the virgin paper. When it comes to the 100% recycled paper, the more recycled content goes in there, the better the paper gets. It's more expensive but it's better. It's hard to believe, but it is. The 100% recycled paper is of far superior quality than the virgin paper. It's thicker and has a nicer finish to it." – Canadian federal government services official, from *Following the Paper Trail* study, Aurora Institute/Reach for Unbleached (Vancouver, BC, Canada), to be published Summer 2003

LISTENING STUDY: Other users are still experiencing difficulties with the runnability of recycled paper in their machines. Sometimes they link these difficulties to higher-speed equipment, higher-postconsumer content paper, or older equipment.

"There are still quality problems with recycled paper. We have experienced jams on high-speed printers using recycled paper. We can only take so much time to resolve the issue, and then we need to switch to a better-performing paper. You have to look at the value proposition: costs include downtime, labor, etc. Paper for high-speed printers is where the big challenges are." – Kathy Gerwig, Kaiser Permanente

"While I have not personally experienced problems, others I know have experienced problems with recycled (30% paper); generally problems are more likely when using older copiers." – (public agency #1)

"I've used the [30% pcc paper] from [supplier] and found it has considerably more curl as it exits my laser writer, compared to the IP "Great White" with 30% postconsumer. Not a postconsumer problem; however, as a less expensive option it was disappointing to experience so much curl. (I've heard two companies complain about this, as well.) My laser printer is an 11-year-old LaserJet IIP Plus that has been a great machine for me. The problem is not debilitating because I don't use large amounts of paper at a time, but I can see where printing even 10-page reports on a shared printer could be problematic if the paper curled too much. Paper jams in equipment sometimes and it can be justified—but other brands might work better and other lots of the same brand might be better. The post-consumer content is often blamed instead of other qualities of the paper." – Jodi Cahillane, Recycled Paper Coalition

"We have very rarely experienced difficulties using recycled paper in particular types of equipment. Our 30% paper has been known to curl more than a virgin sheet on a laser printer that has a very high heat setting. We identified the recycled content as the source of the problem because the curling didn't happen with virgin paper—we addressed the problem by reducing the heat setting on the printer." – Tyson Miller, Recycled Products Purchasing Cooperative

"I bought 2 reams of Conservatree paper (Cadence Cover 65# linen) many years ago for use in cover letters and resumes, and it has lasted a long time. It worked well in my old laser printer, but I do not get as good results with my Epson 777 inkjet. There is slight blurring (the paper seems too absorbent, perhaps), but worse than that, it doesn't feed well. Two or more sheets get sucked through at a time, resulting in many botched print jobs and wasted paper. You may think this is crazy, but I think the paper was either cut wrong (it appears to be a fraction of a millimeter wider than the normal 8.5x11), or else it expands with humidity. This problem doesn't happen with plain white unrecycled copy paper from Staples." – Jennifer Gitlitz, Senior Research Associate, Container Recycling Institute

"Our office of 70 people buys [100% postconsumer copier paper] exclusively and we have no problems with the paper in our mid-size copiers, printers, and faxes. However, another environmental agency that is using the paper began experiencing problems this summer. Unfortunately, I've been too busy to follow-up and resolve the issue with either [the paper manufacturer] or Hewlett-Packard. In a nutshell, here's the problem they've reported: The paper seems to work on HP's 4si and 5si printer series. However, when the agency upgraded to an 8000 HP printer, the paper began to jam consistently. They replaced the new 8000 printer with a refurbished 8000 and the jamming continued. After several service calls, the contractor, GE Capitol, said they would no longer take service calls on the printer if they continued to use the 100% post-consumer paper. The agency switched to the Great White 30% paper and has stopped having problems. I'm not sure what the problem is, but my guess is that the new printer may have a more complex path system which is causing it to jam easier with a paper that may have a higher rag content." – Kelly Luck, Minnesota Office of Environmental Assistance

"We had some minor problems with paper jams with 100% PCC copy paper in a model of copier that we were told typically experienced problems with 100% PCC, for whatever reason. The majority of our copiers ran them fine." - Norm Thompson

"We use recycled paper for non-white paper and when the price is right. Some brands are a problem in copiers too." – (Facility management company)

"I have had reports from some of our field reps that they have had trouble, but have no specifics." – (Document management company)

"In order to see whether it would be feasible to use 100% recycled paper in the computer labs, [we] conducted a 9-month test in two of our labs. . . .Both labs had new HP LaserJet 8000 printers [7 between them] installed. We used [a 100% recycled] paper in [one lab] and [a100% virgin] paper in [the other]. Close to one-half million pages were printed in each lab. . . .

We compared the following between the two labs: number of paper jams that were reported to us, paper dust accumulation, mechanical roller wear, and assessment of parts needing to be replaced. . . .

The printers using 100% recycled paper had extensive paper dust. Therefore, additional cleanings would need to be done if we switched to using only 100% recycled paper. Printers using 30% recycled paper currently need to be cleaned four times per year depending on environment and usage. . . . After vision inspection and analysis of the amount of dust residue, it was estimated that by using 100% recycled paper, the printers will need to be cleaned monthly. . . .

Rollers also wear faster on machines using the 100% recycled paper. Rollers in printers using 30% recycled paper need to be replaced every 125,000 pages. Rollers in printers using 100% recycled paper need to be replaced every 50,000 pages. . . .

There were almost twice as many paper jams reported in the lab using the 100% recycled paper (average of 9.2 jams per 100,000 pages printed) as in the lab using 100% virgin paper (average of 4.7 jams per 100,000 pages printed). . . . [Paper jamming] does occur over twice as often with 100% paper as with 30%. . . . – "Computer Laboratory Printer Paper Test" (unpublished), Academic Computing, Humboldt State University (Arcata, CA), October 2001

"Of complaints indicated about recycled content papers, respondents prioritized paper jams (some 13% of total respondents had heard this critique), the aesthetics of the paper (12.5%), and the amount of paper dust created (10%). In all, just over 1/3 of all respondents shared specific criticisms of the performance qualities of recycled content papers." – *Following the Paper Trail* study, Aurora Institute/Reach for Unbleached (Vancouver, BC, Canada), to be published Summer 2003

LISTENING STUDY: In the experience of some, there are more generic explanations for problems. They often suggest that equipment users and, in some cases, equipment servicers could benefit from education about the fact that the characteristics of recycled paper have changed over the past several years and current performance problems are less likely to be due to the recycled content. This might help broaden the search for the causes of runnability problems beyond the fiber content of the paper used.

"I don't really think that there are problems using recycled paper in printers/copiers. I have successfully been doing that even in my home printer for about 10 years now. The problems that I encounter seem to be with perception. I feel like folks who service the equipment are really quick to blame the problem on recycled paper." – Eleanor Chapman, Los Alamos National Laboratory

"Well, a fair number of folks that we do outreach with have heard that there's dust problems, jamming etc. When we mention who buys recycled from our Purchasing Cooperative and provide samples, we usually overcome that barrier." – Tyson Miller, Recycled Products Purchasing Cooperative

"We have not experienced any problems that we attribute to the recycled content. However, as recently as this year, a [copier service] technician tried to tell us that the recycled content paper was causing the copier to jam. Our Business Services Manager promptly reminded him where he was and told him that the copier should work, as promised, with recycled content paper or we would get another copier." – Andrew Hurst, California Integrated Waste Management Board

"The perception is that recycled paper jams copiers and printers. I've actually been told by more than one repair man that I should not use recycled paper because it will cause problems. Though I personally believe the repairmen scapegoat the recycled content paper in order to avoid admitting the problem is with their machines. I suspect the problem was more with the machine than with the paper; older models may have more trouble digesting the recycled stuff." – Marcella Guerriero, The Lowcountry Environmental Education Program (LEEP)

"We have problems from time to time but we are not smart enough to know if it is paper related or printer (hardware) related." – (consumer products company)

"The dust issue may have arisen with a paper called Unity DP. This paper has been discontinued for a number of years. This paper was NOT made from post consumer waste office paper, but from newspapers. It was 100% post consumer waste newsprint. It was an inferior product, because the material it was made up of was not appropriate for office use. It seems to have 'tainted' recycled office paper's reputation.

I have heard of instances of jamming, but these were usually solved by adjusting the copier intake mechanism. Incidentally the jamming is not limited to recycled papers, I have talked to techs, and they have had to make adjustments for virgin paper as well." – Government Purchasing Project

"King County has elected to rent its nearly 600 copiers, using a WA state contract. We have found that the main variable involved in paper performance is humidity. In 2000, we moved our own offices from the administration building, which is 8 blocks away from Puget Sound, to another building, which is only 1 block from the water. It's unclear if the difference is due to proximity to water or idiosyncrasies of the building's HVAC system, but the humidity seems higher. Paper that ran fine in machines that ran fine now clumps and jams. In the end, it seems a matter of getting the techs to adjust the equipment for whatever paper we are running, and getting them to come re-adjust when there is a move. We have not detected any greater number of troubles with recycled papers." – Eric Nelson, Environmental Purchasing Program
King County Procurement Services, Seattle, WA

"In the Buy Recycled Training program, we are still hearing complaints about recycled paper running in copiers. The complaints are certainly down from where they were several years ago, but we still hear general comments about jamming, etc. I can't give you specifics concerning specific types of equipment, paper characteristics, age, etc. We usually refer the people who make these comments to the U.S. Conference of Mayors study of several years ago and recommend blind tests (to avoid bias). On a related front, we still hear about the 'copier repair person problem.' In this case, I strongly recommend sending a letter to the VP or above of the copier manufacturer to ask about using recycled paper (knowing that the copier manufacturer will not recommend against recycled paper). We are not hearing similar concerns about printing." – Richard Keller, Chief of Recycling, Maryland Environmental Service

"Some manufacturers and service companies blame machine faults on recycled paper and insist that this is not covered by their service warranty. Whilst genuine problems may occur with some products, other factors linked with human error, lack of user experience, training, and the age of the equipment can have a substantial impact upon the effectiveness of the equipment.

For example, older equipment is less likely to be compatible with some, but not all, recycled papers. Recycled paper is typically drier and creates a higher level of dust than its virgin counterparts. This may create a tendency to jam printing and copying machines, particularly if double-sided copying is being done. Regular cleaning avoids this problem....

Many companies successfully use recycled paper in their machines without problems. The key lies in getting the compatibility right between the paper and the equipment, whether owned or leased. Increasingly manufacturers of recycled paper and machines are providing guarantees or endorsements....

Results of performance tests often reveal no significant operational difficulties, i.e. jamming or increased machine servicing, if the conditions are right from the start. 'Blind' testing can be a useful experiment to overcome resistance to recycled papers, especially when an item's performance equals or out-performs the existing product in use. All reputable paper mills and suppliers offer trial samples to genuine customers....

The issue of invalidating service warranties by using recycled paper can be problematic, as clauses concerning paper use are often written into the service contract from the outset. Some copier manufacturers specify sole use of their own brands of recycled paper whilst others recommend particular brands." – Waste Watch, National Recycling Forum, United Kingdom

"The Environmental Defense Fund (EDF) Paper Task Force published a comprehensive report on the usage of various types of paper with 20% PCC. The Task Force determined that paper jams are not caused by recycled paper but most often are a function of four factors: 1) auto-duplexing, 2) the speed and condition of the equipment, 3) the quality level of the paper, and 4) operator errors." - original source: Environmental Defense Fund, 1995, *Paper Task Force Recommendations for Purchasing and Using Environmentally Preferable Paper, White Paper No. 1*, quoted in "Availability, Performance, and Cost of Recycled Paper," North Carolina Division of Pollution Prevention and Environmental Assistance

"Our impression is that the 'dust' devil came from some papers from the 60's that really were bad that way, and even some newer papers that were of poor quality or inappropriately marketed. Before anybody ever heard of 'Buy Recycled,' there was a huge range of quality in papers. After recycled content became an objective, especially for governments, the marketplace rushed to develop recycled content papers. After the dust settled, as it were, there was still a huge range of quality, with recycled and virgin papers each covering the same, familiar, quality range. The recycled content was not relevant to the quality, but there was that big R on the box, and it became a handy scapegoat (not to say NObody was selling junk. This is a free country, after all)." – Eric Nelson, Environmental Purchasing Program, King County Procurement Services, Seattle, WA

"There are urban myths associated with paper that is recycled such as the fact that it gets stuck in office machines. These urban myths have basically been totally overcome through time but they are very difficult, as urban myths are, to eliminate entirely." – provincial government employee, from *Following the Paper Trail* study, Aurora Institute/Reach for Unbleached (Vancouver, BC, Canada), to be published Summer 2003

"25, 30 years ago if you talked to anybody about recycled paper it was like voodoo – people didn't want it, it was dusty, it jammed up their machines, the quality wasn't there; there was every excuse in the book. It took about 15 years for that to work its way through the system, from a marketing perspective. At one point you had the business machines people saying that they'd void your warranty if you used recycled sheets in their machines. And quite frankly, it took the mills 15 years to up the quality of the sheets. Now, going back 5 or 6 years ago it became very chic for companies to use recycled paper – the grainier the better – and the paper was of a very high quality and worked well in the machines, it looked nice and it became really

ingrained in the marketplace." – environmental products expert, from *Following the Paper Trail* study, Aurora Institute/Reach for Unbleached (Vancouver, BC, Canada), to be published Summer 2003

ENVIRONMENTAL GROUPS/ENVIRONMENTAL PAPER ADVOCATES

Some environmental groups and advocates have particular expertise in environmental paper issues. They are likely to add perspectives and information, whether through research, testing, or experience, that others may not.

We include Conservatree's perspectives in this section, as well. This is where we think it is appropriate to add our opinions based on experience over decades of interaction with environmental paper markets, both to include our expertise but also to give the reader a basis for evaluating our biases. Although we hold opinions on many questions in the Listening Study, our intent is to express them only in clearly identified quotes or sections such as this one, similar to everyone else's opportunities to comment. In the rest of each report, we hope that the body of quotes speak for themselves, without filtering through our lens. If you believe we did not succeed at that, please let us know so we can correct it.

"Compared to the same type of virgin fibers used in the same application, recycled fibers have different properties. . . . Generally speaking, recycled fibers have reduced bonding potential compared to their virgin counterparts, which tends to reduce strength and requires compensation in the manufacturing process. In some circumstances, however, recycled fibers may also impart desired qualities to the paper sheet, such as smoothness and dimensional stability.

. . . [T]he Task Force has found that large quantities of recycled-content papers are available that meet specifications and perform comparably to virgin paper. . . . [T]he quality of paper with recycled content is generally not a barrier to purchasing at levels of postconsumer recycled content that are now available. . . .

At the very upper edge of the spectrum, the highest-quality virgin paper may have a slight advantage over the highest-quality recycled paper, but there are many recycled-content papers that perform as well as virgin paper and some that perform better than their virgin counterparts. The age, capabilities and operation of papermaking equipment have a greater impact on the properties of the finished paper than its recycled or virgin content.

Papermakers adjust for the differing properties of recycled fiber in numerous ways in the manufacturing process. . . . Many of the adjustments made on the paper machine to compensate for the properties of recycled fiber are analogous to those made to compensate for attributes of different tree species, for example." – *Paper Task Force Report*, Environmental Defense Fund, 1995, p. 83

"Based on extensive interviews with paper and equipment manufacturers, the Task Force found that frequency of copier machine jams is not correlated with the use of recycled-content paper. The majority of jams are a function of several factors, such as two-sided copying, the speed and condition of equipment, the quality of the paper being used ([no matter] whether it is recycled or virgin) and operator errors." – *Paper Task Force Report*, Environmental Defense Fund, 1995, p. 90

"People still frequently tell me that they are afraid to use recycled paper in copiers because they think it will jam or dust so much it will damage the machine. Someone even told me that they are afraid that bits of staples and paper clips recycled with the fibers will scratch the copying machine drum. I felt they needed more understanding about how recycled paper is made. Another insisted that recycled paper 'has a noxious odor when it goes through the copier.'

Yet paper manufacturers tell me that their recycled paper meets the same specifications as their virgin paper, thousands of offices across North America using all kinds of copiers

report that they're using recycled paper with no problems, and every copier equipment manufacturer Conservatree has interviewed over the past six years has assured us that their copiers have no problems running recycled paper. In fact, many state and local governments include requirements when they're buying copiers that the equipment must be guaranteed to run recycled paper and I have not heard of any copier company that has opted out of bidding because of that requirement.

Still, I can't discount end-users' reports. There must be reasons for them. Yet I have found many of them difficult to pin down. For example:

- When I ask for details on the problems, people frequently tell me, 'Oh, it was years ago.' But we don't expect today's computers, or calculators, or cars, or other technological products to be the same as they were years ago. So why paper? Is it because it doesn't 'look' different over the years? Why does experience from years ago have such a strong impact on people's perceptions today?
- When people tell me that using recycled paper will void their warranty, I always ask for a copy of the warranty. I have only gotten one copy, and that was for an office printer over ten years ago. Where are all the others? Do they really exist? The copier equipment companies tell us no. Did they exist in the past but not now? If there are still such warranty prohibitions out there, I'd like to get copies of them, to get to the bottom of this problem.
- One government staff person told me that her office used recycled paper in all their copiers except for the one used by the top executives. That one, she insisted, constantly jammed when people used recycled paper in it. I said, 'Let's check that out, then, and solve that problem. What kind of copier is it? How often is it jamming? How do they know it's because of recycled paper?' She interviewed the people who used that copier - and discovered that the problem had disappeared long ago, but the belief had not. In fact, it had continued spreading to more and more people. This seems to be a common occurrence.
- I notice that when people say recycled paper is causing problems, the information they give, more times than you would expect, tells me that they're using old recycled paper - sometimes *several* years old, or they're using types of paper that were not made to run through high speed copiers. Paper absorbs moisture from the air, whether it's virgin or recycled paper. It needs a particular moisture balance and type of finishing to run properly in copiers and high-heat office printers. A couple of copier papers are meant to be used only in copiers or laser printers, not in ink jet printers. Because they are not sized (surface-sealed) for use in ink jet printers, the ink may blur the letters slightly if they are used in them. Yet people using old papers or the wrong type of papers still tend to assume that recycled fibers are to blame when the paper doesn't run well.
- I have heard of several blind tests (alas, not always written up) in which the paper users were relieved to finally get 'some good copier paper for a change after that awful recycled paper' - only to find that the 'good copier paper' they were relieved to get is also recycled paper. So much seems to be psychological.

I want to clear away the recycled paper blame that comes from old experiences, old or inappropriate grades of paper, improper paper storage, improperly adjusted copiers, and misunderstandings about the rigorousness of the deinking process. Then let's deal with today's reality and today's recycled papers. This would not do away with every problem and every complaint - every product, including virgin papers, has some problems in some cases - but it would allow the ones that remain to be resolved in a fact-based manner, just as they are with virgin paper. Especially, it would allow paper purchasers and paper users to buy today's recycled paper with confidence, rather than with the uncertainty and suspicion that seems too common today.

The fact that high profile copier equipment manufacturers such as Xerox and office printer manufacturers such as Hewlett-Packard provide recycled paper under their brand names should make paper buyers and paper users confident that recycled paper is appropriate for office machines." – Susan Kinsella, Conservatree

"When compared head-to-head against virgin fiber papers, recycled papers are almost universally held to not have comparatively better performance. However, many respondents weren't sure if there was any discernible difference, and many saw no difference in quality, either. When asked, 'For each statement, please indicate whether there is any discernible difference between recycled content vs. virgin fiber paper,' respondents answered as follows:

Comparison	Virgin Fiber	Recycled Fiber	No Difference
Less apt to jam in office machines	46	1	32
Less paper dust produced	39	3	27
More visually appealing	40	5	37
Better quality in photocopying	40	2	44
Better quality in computer printing	32	1	47

Source: "Following the Paper Trail" study, Aurora Institute/Reach for Unbleached (Vancouver, BC, Canada), to be published Summer 2003

It would appear that many people, even at the dedicated procurement manager level, lack a baseline of knowledge of the performance capacities of virgin fiber vs. recycled content/chlorine free papers. Of those that do have some knowledge, much of this should be chalked up to perception based on innuendo rather than tested facts. The mythology of quality difference remains, despite solid evidence that quality gaps have been fixed in the past decade." – *Following the Paper Trail* study, Aurora Institute/Reach for Unbleached (Vancouver, BC, Canada), to be published Summer 2003

EQUIPMENT MANUFACTURERS

Major manufacturers of printers, copiers, and other office machines were interviewed separately about the performance of recycled paper in their equipment. Nearly all manufacturers found no reason why there should be any differences between the performance of recycled or virgin paper in their equipment. Manufacturer responses to specific survey questions follow. Some questions are repeated in a number of different ways to get at nuances in the responses.

LISTENING STUDY: We're hearing from many people that they're afraid to use recycled paper because it would void their copier warranty. Does your warranty say that?

"No. In fact, our official contract information says our machines produce satisfactory copies on recycled paper." – Copier Manufacturer A

"There is no voiding of the warranty for using recycled paper in our laserjet printers." – Paul Quickert, Hewlett-Packard

"No. Warranties are more performance-based. We can't tell the customer what type of paper to put in our machines; our only restrictions are based on size and weight." – Copier Manufacturer C

"If a product is approved for use, a standard warranty would apply. Our warranty policy is stated on our website, but doesn't mention specific papers." – Frank Stadler, Océ-USA

"No, there is nothing specific in our warranty with reference to recycled paper." – Savin

"No, there is no language in our warranties mentioning recycled paper." – Copier Manufacturer G

"Our warranty does not specifically state that. Our operation manual states that we can support recycled paper as long as it is suitable for that copier." – Copier Manufacturer H

"Xerox warranty language does not prohibit the use of recycled paper in its copiers, printers or multifunction systems." – Elizabeth Graves, EH&S Regulatory Affairs Manager, Xerox

LISTENING STUDY: If your warranty does not expressly prohibit the use of recycled papers, then where do you think this concern is coming from?

"I have heard of some people having trouble with recycled paper, but I think it depends on the grade of the paper. I am not aware of any problems with recycled copier paper." – (Copier Manufacturer A)

"No idea. These days, however, we get fewer requests for information on the use of recycled paper in our machines, and fewer bid specifications now require recycled paper. Cost is a big issue, but not the only issue contributing to this problem; it is still hard to overcome buyers' opinions based on past experience of runnability problems with recycled paper." – Savin

"To answer this question, you have to look at the history of recycled paper. Recycled paper has a history when it became fashionable, and the federal government required that machines accept recycled paper. Back 10 or 15 years ago, some of the paper on the market was pretty bad, in terms of copier performance: how it fed, how clean it was. Dust and lint will increase

problems. Also, there were experiments with bonding materials. 'Inert' ingredients were problematic. The paper was bad, and machines were not designed for it. Probably, at that time, some companies said using recycled paper would void their warranties." – Copier Manufacturer H

"Xerox develops for each of its products (copiers, printers, multifunction systems) a 'recommended media list' – a list of papers and other media that Xerox has tested extensively to ensure optimal print quality and runnability in Xerox equipment. These lists include a wide range of papers, including recycled papers.

If a customer reports a print quality or runnability problem with a paper that is not included on the recommended media list, a Xerox service technician responding to the customer will recommend that the customer try another batch number of the same paper or a different brand of paper. If a customer continues using the problem non-recommended material, Xerox might consider subsequent service calls related to the problem material to be outside of the customer's service contract (and the service calls would be an additional charge to the customer)." – Elizabeth Graves, EH&S Regulatory Affairs Manager, Xerox

LISTENING STUDY: Is there anything in your warranty about recycled paper, whether forbidding it or accepting it?

"There may have been something early on in our warranties pertaining to recycled, but that is definitely not true today. The warranties do limit/prohibit remanufactured toner cartridges." – Paul Quickert, Hewlett-Packard

Our operations manual states the following:

"Use of Recycled Paper in the Copier: As with all copiers and reproduction devices, the use of the appropriate paper ensures the best image quality of the copies and the machine's performance and reliability. Because of the extreme variances in composition and quality of paper from various manufacturers, consumers should ensure the recycled paper they use is suitable for the copier. In accordance with the EPA Energy Star Program guidelines, [Manufacturer H] recommends the following recycled papers for use in the copier:

Great White MultiUse 20 paper

Great White MultiUse 24 paper

If you have any questions regarding the use of recycled paper in your copier, contact your authorized service technician." – (Copier Manufacturer H)

LISTENING STUDY: What is your policy regarding use of recycled paper in your copiers?

"For inquiries on recycled paper, [Manufacturer A] has issued the following statement: [Manufacturer A] Copying Equipment (except Color Laser Copiers) produces satisfactory copies on recycled paper that meets the Joint Committee on Printing Standard JCP 0-65." – Copier Manufacturer A

"We have no official policy regarding the use of recycled paper in our copiers by customers." – Paul Quickert, Hewlett-Packard

"Our machines accept and use recycled paper. It's in our specs, but that's an internal document only." – Copier Manufacturer C

"Our parent company is committed to using recycled products and recycled paper." – Savin

"Xerox designs all of its papers, regardless of their recycled content, for optimal performance in Xerox equipment. Xerox recycled papers must meet the same stringent performance and reliability standards (including strict specifications for dust, contamination, paper curl, static, and cut quality) as comparable virgin papers, and carry the same guarantees. The "recommended media lists" that Xerox develops for each of its products include a wide range of papers – both virgin and recycled." – Elizabeth Graves, EH&S Regulatory Affairs Manager, Xerox

LISTENING STUDY: What is your experience with the use of recycled papers in your copiers?

"We don't have any problem with the use of recycled papers in our copiers." – Copier Manufacturer A

"We can't release our internal information on studies/tests on recycled and treefree papers. Virtually all the recycled papers out there are indiscernible from virgin: they're dust-free, acid-free, etc." – Paul Quickert, Hewlett-Packard

"Most of the problems we have encountered with higher postconsumer content papers relate to increased curl – the shorter fibers cause the paper to curl more frequently in the heat of the copier process." – Savin

"In copiers in general, not just ours, some recycled papers perform better than others. Factors like postconsumer content may not be the problem; it depends on how it's manufactured. Higher postconsumer content represents a greater challenge for the manufacturer (in terms of keeping the quality high)." – Copier Manufacturer G

"Our experience is similar to the general history of paper usage, including abrasions and dusting. The industry caught up quickly and we've been recommending recycled paper for at least 7 years, minimum. Recycled paper improved, and now feeds as well as virgin. You can take the top quality paper of many manufacturers and they'll pour equal amounts of dust in. A brand isn't assurance of quality. Papers from East coast mills have different fiber lengths because of their source of raw fiber. We do test and we can recommend specific papers. In the Japanese market, recycled paper is almost the whole market, and there are no issues with it." – Copier Manufacturer H

"Xerox tracks inquiries/complaints from owners of Xerox equipment having difficulty with paper and other media. Complaints about Xerox papers are tracked separately from those for competitive (i.e. non-Xerox) papers.

With respect to Xerox papers, we do not see a disproportionately high level of customer dissatisfaction with recycled paper. Complaints about Xerox recycled paper account for less than 1% of all complaints about Xerox papers. By contrast, recycled paper does account for a somewhat disproportionately high percentage of complaints from customers running competitive papers in their equipment. Although we estimate recycled paper represents only 5% of total paper used in Xerox equipment, more than 10% of all complaints about competitive paper are attributable to recycled paper." – Elizabeth Graves, EH&S Regulatory Affairs Manager, Xerox

LISTENING STUDY: Is there any problem with using recycled paper in your copiers? Specifically, is there a problem with dusting (which can impair the operation of optical sensors) generated by higher postconsumer content papers?

"Paper dust is the number one concern in affecting a machine's capability. Whether or not the paper dusts varies from paper to paper - it doesn't specifically relate to the fiber content." – Copier Manufacturer A

"I have no idea why people think recycled dusts more, although I do hear that complaint about recycled paper. I also hear complaints about multiple sheet pulls and jamming (probably due to multiple sheet pulls). People also have a misconception about recycled paper being only dull brown or gray." – Paul Quickert, Hewlett-Packard

"I have no experience of dusting caused by recycled papers. We've tested various papers internally, including recycled papers." – Copier Manufacturer C, marketing division

"Recycled paper does tend to dust more than virgin paper. I think it's the way it's recoated. It depends on the chemical content. I haven't noted a correlation of increased dusting with higher postconsumer content." – Copier Manufacturer C, quality assurance division

"Several years ago, I was in a group that tested the performance of recycled paper in our copiers. At the time, we were testing to look at the dusting issue. The recycled paper we tested then did generally have more dusting than virgin paper. However, this was several years ago; I think recycled content paper has improved a lot since then." – Frank Stadler, Océ-USA Holding, Inc.

"Primarily, dusting is caused by inadequate vacuuming. Another reason papers dust more is that papers are now alkaline- rather than acid-based. An alkaline-based sheet requires less harmful chemicals, and is better for the environment, but an alkaline sheet accepts or absorbs more chalk and fillers in the papermaking process. That chalk residue sticks to the sheet after cutting, and is still on the sheet when it is fed into the copier, which contributes to a greater dusting factor. Dusting is more about alkaline vs. acid than about fiber content." – Savin

"Bad recycled paper can dust and misfeed – although this is true for bad virgin paper as well and isn't necessarily due to the recycled content. Lower quality postconsumer paper can cause more dusting, which results in the need for additional cleanings and service requirements." – Copier Manufacturer G

"We only know the ones we test. We test ones that have the broadest market share as a service to our customers." – Copier Manufacturer H

"The complaints that Xerox has received year-to-date for competitive (i.e. non-Xerox) recycled papers are linked to two problems. The most common issue is excessive contamination or dirt that negatively impacts image/print quality. A second issue is excessive paper curl that impacts runnability (i.e. causes paper jams).

The problems of excessive curl and contamination are quality issues related to the paper manufacturing process. Recycled papers, just like virgin papers, vary from high- to low-quality in terms of print quality and runnability. Producing a quality paper requires papermakers to establish strict performance specifications and to control the variability of the papermaking process to meet these specifications consistently — regardless of the production run, or the paper machine or mill making the paper.

Xerox has long recognized these potential quality issues with recycled paper. To address them, we've established for Xerox recycled papers the same stringent performance and reliability specifications that apply to their virgin counterparts. These specifications establish acceptable ranges for paper dust, curl, paper static, and cut quality to ensure optimum runnability." – Elizabeth Graves, EH&S Regulatory Affairs Manager, Xerox

LISTENING STUDY: If you feel there's no problem with using recycled in your copiers, how do you respond to people who claim they DO have a problem running recycled in your copiers? What do you think is causing that problem?

"We refer people to our contract language, and let their dealers look into their situation." – Copier Manufacturer A

"I personally think some copiers just have a ghost in the machine. Internally, our people complained when we brought in recycled paper, but I haven't seen a single case in which problems could be substantiated as due to recycled. There is a negative attitude about environmental issues in general - stories in the mainstream media are more about doom and gloom than actual science. That's even true in this [geographical] area, which is one of the most educated areas about environmental issues. People aren't closing the loop. We have to be careful how we market our products." – Paul Quickert, Hewlett-Packard

"30% postconsumer is a much better paper than the previous paper specified by the government (50% recycled, 10% postconsumer). 30% is an acceptable level of postconsumer content - higher content is problematic. Paper sheets require long-grain fibers for structural stability, and there are too many short fibers in a sheet with greater than 30% postconsumer content, making that sheet less structurally strong. In packaging materials, higher postconsumer content is not problematic, but copiers are pickier in the kinds of paper they'll accept. The standardization of paper has helped, as has improved copier technology - today we have better paper products and better copiers." – Savin

"Recycled paper is also less stiff, so it presents more of a challenge when duplexing. There are different ways the manufacturer makes recycled paper stiff enough to perform. The chemical composition of a particular paper can be linked to [increased dusting]." – Copier Manufacturer G

"We distribute through authorized dealers, and problems are handled at that level. It's not too difficult. Problems are usually narrowed down to a specific paper, and aren't specifically due to the recycled content. For example, there was a batch of virgin paper from Brazil used in Florida where 1-inch pieces fell off. That was the most recent problem we faced associated with paper. Problems are often an environmental issue: low humidity and high humidity are common causes of problems." – Copier Manufacturer H

"We typically first recommend that the customer try another batch of the same paper. If the problem continues, we recommend another brand of paper that is on the list of recommended media we've developed for that particular Xerox product. Our approach to resolving issues with problem papers is the same for both virgin and recycled papers.

We believe that low-quality recycled papers, just like low-quality virgin papers, cause runnability problems in copying and printing equipment. We also know that it is possible for recycled papers to achieve the same performance and reliability levels as comparable virgin papers." – Elizabeth Graves, EH&S Regulatory Affairs Manager, Xerox

LISTENING STUDY: Do you train copier maintenance people to be positive towards use of recycled paper?

"We outsource our copier maintenance." – Copier Manufacturer A

"We outsource our copier maintenance." – Paul Quickert, Hewlett-Packard

"We outsource our copier maintenance." – Savin

"Service contracts are handled individually by each independent dealer; there is no training done by our company." – Copier Manufacturer C

"We sell our machines through dealerships, which are individually responsible for servicing the equipment." – Copier Manufacturer G

"We sell machines to dealers and they perform maintenance. Maintenance people point out papers recommended in the manual, and have a neutral bias toward recycled papers." – Copier Manufacturer H

"Xerox trains our service technicians to focus on customer satisfaction as their primary goal, and to work to maximize the 'uptime' of customers' Xerox equipment. To this end, service technicians promote the use of high-quality paper over low-quality paper (as opposed to promoting virgin paper over recycled paper).

Our technicians follow the same approach to solving problems with defective papers regardless of whether the paper is virgin or recycled — the primary focus is making every effort to help customers use their paper of choice. If a customer reports a runnability problem with a competitive paper, a Xerox service technician recommends that the customer try another batch number or brand of paper. For example, if the problem paper contains recycled content, the service technician would recommend the customer try another brand of recycled paper (as opposed to recommending a switch to virgin paper).

If a customer reports a print quality problem, a service technician evaluates a machine's set-up, the quality of the machine's imaging components, and the paper being used. In some cases, this evaluation shows that a low-quality competitive recycled paper is causing the image quality issue (high adhesive/plastic content in the paper builds up on the photoreceptor, producing spots on copies/prints). In these cases, the technician presents the results to the customer. It is the customer's decision to continue using the paper or not, recognizing the implications to print quality." – Elizabeth Graves, EH&S Regulatory Affairs Manager, Xerox

LISTENING STUDY: Do you provide a brand-label recycled copier paper yourselves?

"No." – Savin

"No." – Copier Manufacturers A, G, H

"No." – Frank Stadler, Océ-USA Holding, Inc.

"Yes. And I've finally gotten our Office Recycled Paper adopted by all our internal North American operations." – Paul Quickert, Hewlett-Packard

"No. Our distributors are independent; some sell paper, and some don't. Some might sell recycled paper, but I don't know for sure." – Copier Manufacturer C

"Yes. In the U.S., Xerox offers Multipurpose Recycled paper with 30% post-consumer waste, and several premium products, including colored and parchment papers, designed specifically for digital color printing applications. Our European division provides 100% recycled content paper." – Elizabeth Graves, EH&S Regulatory Affairs Manager, Xerox

LISTENING STUDY: Can you tell us anything else to help us get a clearer picture of the use of recycled in your copiers? Have you done any tests or studies?

"We participated in the U.S. Conference of Mayors Study, but haven't done any studies since then. More images are being printed on printers these days than on copiers. People think there is recycled content in all paper, and they think there is recycled content in all equipment, as well. Because there are so many recovery programs in place, they assume it's magically happening." – Paul Quickert, Hewlett-Packard

"Our parent company, Ricoh, has done the studies. Our internal testing of the major recycled papers made by International Paper or Domtar (taking into account Domtar's recent acquisitions of Georgia Pacific, etc.) have proven them to be good products. Some of the other products made by other mills might not be as good." – Savin

"Xerox measures office equipment owners' satisfaction with corporate environmental initiatives and product environmental attributes on an annual basis. Between 1996 and 1999, our U.S. survey included the following question: 'Are you satisfied with the performance of your equipment when using recycled paper' [yes or no]? This question was asked to owners of Xerox and competitors' equipment.

The proportion of office equipment owners indicating that they were satisfied with the performance of recycled paper increased by 17 percentage points over this time period, reaching 94% in 1999.

Survey background: The Xerox survey is conducted blind (Xerox is not mentioned as the sponsor) and by telephone. The survey sample includes owners of office equipment (copiers, printers, fax and multifunction equipment) randomly selected from approximately 10 million establishments in the U.S. market. Respondents are asked to identify one specific brand and type of office equipment they own. All subsequent questions pertain to the one identified product.

Findings are presented using percentages; the total number of office equipment owners answering the question is used as the percentage base (i.e., "don't know" answers are excluded from the percentage base). The sample size typically provides a 2-3% margin of error for results." – Elizabeth Graves, EH&S Regulatory Affairs Manager, Xerox

During the Fall and Winter of 1998, Canon U.S.A, Hewlett-Packard, and Lexmark evaluated three brands of 30% postconsumer multipurpose recycled content paper, using paper with 20%-25% postconsumer and virgin fiber content as controls. The U.S. federal Government Printing Office also tested over a dozen brands of 30% postconsumer copy paper. Altogether, over 2 million sheets were tested on various types and models of copiers, laser printers, and ink jet printers for physical properties and performance. Tests covered paper feeding, reliability, image

quality, toner fixability, smoothness, and curl, among other things. The 30% postconsumer studies showed equivalent performance to 20%-25% postconsumer and virgin papers. – “No More Excuses,” National Office Paper Recycling Project, United States Conference of Mayors

COPIER EQUIPMENT EXPERTS

LISTENING STUDY: We're hearing from many people that they're afraid to use recycled paper because it would void their copier warranty. Does your warranty say that?

"I have never heard of warranty limitations on the use of recycled paper in copiers. Our environmental assessment of the copiers we use asks if the machine has been designed to use recycled paper; they all are. Some printers, rather than copiers, might not say they're designed for recycled." – Larry Rogero, Kinko's

LISTENING STUDY: What is your policy regarding use of recycled paper in your copiers?

"We stock all our self-service machines with recycled paper. We have increased our use of recycled paper, from 6% of our total fiber usage to 14% of our total fiber usage; we have seen no impact on our productivity from that shift." – Larry Rogero, Kinko's

"NASA requires its copier equipment vendor to also provide recycled paper that works. The vendor has to take out any machines in which the paper doesn't work or causes problems. Suddenly, the service technicians stopped blaming the paper." – Fran McPoland, former Federal Environmental Executive, National Recycling Coalition conference, January 2002

LISTENING STUDY: Is there any problem with using recycled paper in your copiers? Specifically, is there a problem with dusting (which can impair the operation of optical sensors) generated by higher postconsumer content papers?

"We have had problems with a particular recycled product. We ran a 100% postconsumer paper that jammed frequently in our big high-speed copiers. I think it was a bad run or bad mill; I don't think the problems were necessarily due to the recycled content. Other branches use only 100% pcc in their high-speed copiers and don't experience any problems. One of our branches stocks all express copiers with 100% pcc, and doesn't experience any problems." – Larry Rogero, Kinko's

LISTENING STUDY: Do you train copier maintenance people to be positive towards use of recycled paper?

"We do not specifically train our employees regarding recycled paper. We do get technicians who say that copier problems are due to the poor quality of the paper, but the paper quality isn't based on the recycled content. Virgin papers have problems too." – Larry Rogero, Kinko's

LISTENING STUDY: Can you tell us anything else to help us get a clearer picture of the use of recycled in your copiers? Have you done any tests or studies?

"Regarding the recycled paper that we run in our test units, which contains 30 percent post-consumer content, BLI Senior Test Technician Bernard Lyons has found no noticeable difference in the runnability of recycled paper versus virgin paper. In a survey we published in January 2001, close to 40 percent of the respondents reported using recycled paper, with 100 percent of them reporting being satisfied with the paper." – Daria Hoffman, Buyers Laboratory, Inc., an independent office products testing laboratory, Hackensack, NJ

Excerpts from "Recycled Paper: The Good, the Bad and the Ugly," Special Report by Lynda Perini, Associate Editor, Buyers Laboratory, Inc., October 1995 (Buyers Laboratory, Inc., an independent office products testing laboratory in Hackensack, NJ, tests copier models for subscribers such as major corporations and always includes recycled paper in the paper used to test the machines.):

"We've contacted purchasers, users and manufacturers of both recycled paper and office equipment, as well as industry experts. The report also incorporates information obtained from a survey on the use and runnability of recycled paper sent to our subscribers. . . .

To keep this report in perspective for the general office, we've kept the focus primarily on copy paper, that is, paper generally used in office equipment such as printers, copiers and facsimile machines. . . .

BLI received a total of 210 responses, which were split evenly between recycled paper users and non-users – 51 and 49 percent, respectively. . . .

BLI's survey results indicated that an overwhelming 90 percent of recycled paper users rated runnability as either the 'most important' or a 'very important' purchasing criteria. . . . And of those who do not use recycled paper, among the top reasons cited were concerns about how it would perform in office equipment, either based on hearsay (27 percent) or experience (25 percent). . . . However, judging by the 82 percent of responses that found the runnability of recycled paper to be either 'excellent' or 'good,' it seems that for the most part, recycled paper is meeting users' expectations. . . .

The 84 respondents who use recycled paper commented on its use in 240 specific office products. . . . [F]or the most part the need for service and for user maintenance has remained the same since recycled paper has been used instead of virgin paper. . . . Only 16 percent of responses cited an increased need for service since recycled paper has been used in their equipment, while 84 percent said service levels had remained the same. . . .

[M]ost subscribers interviewed by BLI agreed that its runnability is largely comparable to that of virgin paper. As a matter of fact, BLI's own experiences with recycled paper also reflect this. In BLI's copier testing, 10 percent of the total volume of paper used is recycled paper with 20 percent post-consumer content This paper is used in about 50 to 60 copiers per year, and technicians have reported that this paper runs with no more problems than virgin paper. . . .

Most of the paper manufacturers we spoke to said that recycled papers offer a performance equivalent to that of their virgin counterparts, without excessive misfeeding. It is the physical characteristics of the paper, such as surface smoothness, thickness and porosity – not recycled paper content – that determine whether the paper will run well, they said. . . ."

RECYCLED PAPER MANUFACTURERS

LISTENING STUDY: We've heard from several end users that they're afraid to use recycled paper because it would void their copier warranty. We've asked copier manufacturers if this is the case, and all of them said they didn't have language specifically prohibiting the use of recycled paper in their copiers. Do you know of any warranty language which prohibits or limits the use of recycled paper in office equipment?

"While the copier and laser printer manufacturers may not prohibit the use of recycled paper without voiding the equipment's warranty, many of them suggest that the use of recycled papers will harm the equipment and have trained their service technicians to 'warn' customers about using paper with recycled fiber content. This 'scare' tactic was started when recycled fiber was just beginning to be used in paper, before the process was optimized, and in many cases the copier and laser printer manufactures have not re-examined the recycled products to obtain accurate updated information. IP products have been tested in numerous copy machines and run as well or better than virgin fiber products." – International Paper

"No. In fact, this is the first time I have heard of the issue of recycled paper use voiding warranty of copier/printers." – Badger Paper Mills

"No." – Georgia Pacific Paper

"No." – Grays Harbor Paper, L.P.

"One of Weyerhaeuser's environmental priorities is conservation of natural resources through recycling and waste reduction. As the second largest recycler in North America, Weyerhaeuser is in a unique position to offer 'closed loop' service to our customers. We can collect their recycling at competitive prices; process and ship the collected recyclable paper to mills; use recycled fiber for our fine paper and other products; then sell those recycled paper products back to our customers. Sustainable practices like this support our customers' environmental goals and provide recycled paper that performs in a variety of copiers and printers. Since our papers are designed with minimal curl, dusting and excellent dimensional stability, they are meant to perform in current printers and copiers. The copier manufacturers will have to comment on warranty issues." – Weyerhaeuser

"No. Sometimes a copier company representative will recommend their own brand of paper. But there is no reason not to use recycled paper." – Gerry Zampini, Vice President, Sales and Marketing, Cascades Fine Paper

"Domtar does not know of any warranty language which prohibits or limits the use of recycled paper in office equipment." – Domtar, Inc.

"I am not aware of any warranty language that prohibits the use of recycled papers in equipment." – Vince Phelan, Director, Product Management and Marketing Communications, Boise Paper Solutions

LISTENING STUDY: What is your experience with the use of recycled papers in copiers and printers?

"International Paper has been producing paper with recycled fiber content for over 20 years, investing much time, money and technology with the goal of producing a sheet containing significant amounts of recycled fiber which performs in copiers and laser printers equal to a virgin sheet. Our extensive testing on both copiers and laser printers shows that our grades with recycled fiber produce the same excellent print quality and runnability as our virgin grades. Our guarantee of excellent performance is the same for our recycled and virgin grades."
– International Paper

"Badger products have had an excellent performance record in copiers and printers due to the consistent quality of our manufacturing. The Envirographic brand is Badger's workhorse paper." – Badger Paper Mills

"Our experience is that recycled paper is comparable to virgin paper with respect to runnability and image quality. In the early 90's some suppliers experienced difficulty with "sticky" content that led to contamination of photo receptors until fiber recovery technology improvements resolved the problem." – Georgia Pacific Paper

"Positive. We use virgin and recycled papers interchangeably." – Grays Harbor Paper, L.P.

"Our goal is customer satisfaction. Our recycled papers are made to the same end use standards as our virgin paper product." – Weyerhaeuser

"When recycled copier papers first came out in 1987-88, the pulp was very different from the current pulp used to make today's papers. We have come a long way since then. Recycled paper no longer jams or creates other problems.

We ourselves own a deinking plant and the pulp there is far superior to what was then used to make paper. We can see at the deinking plant whether the pulp can hold out for making good paper, before it gets to the manufacturing plant. As an example of the high quality of our deinked pulp, the recycled pulp from our Breakeyville deinking plant is used interchangeably with virgin hardwood pulp. It's the same whiteness, brightness, and same characteristics, less a little bit of bulk, which is common for recycled pulp.

We sell about 30-35,000 tons of cut paper every year with high concentrations of recycled content, at least 30-40% postconsumer. All of New York State, as well as New York City, is now using our recycled copier paper, which contains a minimum of 50% recycled (30% postconsumer). We have not had one jam, problem or concern for all of these users. That's the proof - we are competing against virgin papers and we have equalized the quality of our recycled papers." – Gerry Zampini, Vice President, Sales and Marketing, Cascades Fine Paper

"We recommend the use of recycled papers in copiers and printers for environmentally conscious companies." – Domtar, Inc.

"We have conducted third-party testing on multiple equipment platforms on Boise's Aspen 100 product, and we found the results to be outstanding and comparable to virgin-content papers. Our market experience with Aspen (30% post-consumer content paper) has been the same." – Vince Phelan, Director, Product Management and Marketing Communications, Boise Paper Solutions

LISTENING STUDY: Some users have reported experiencing runnability problems with recycled paper in their machines. Often, they link these difficulties to higher-speed equipment, higher postconsumer content paper, or older equipment. Do you have any

experience or comments on whether any or all of those factors contribute to runnability problems, or if there are other factors affecting runnability?

"The present recycled grades available are greatly improved compared to grades that were offered 10 years ago. In the past, a higher amount of groundwood content was used in the recycled process. It has been determined that it is necessary to keep the groundwood content minimal to control post-image curl. Again, it is important that customers are basing their opinion on recycled grades now available and not on experiences gathered years ago." – International Paper

"Badger products have a proven history in high speed copiers." – Badger Paper Mills

"Runnability is influenced by paper properties that are not necessarily impacted by post consumer content. If the recycled paper has been made to conform to specifications appropriate for the intended end use, it should run without incident." – Georgia Pacific Paper

"Higher speed equipment is always more susceptible to runnability problems, regardless of recycle content. Our experience with 30% PC recycled paper is that it runs as well as virgin. Older equipment often have runnability problems with recycled and virgin copy paper." – Grays Harbor Paper, L.P.

"Weyerhaeuser sells paper through a variety of channels and receives feedback from end users in a number of ways. Today's copiers are becoming higher speed and that can put different demands on a sheet than slower speed copiers, whether recycled or virgin paper. If there are performance issues with our paper, Weyerhaeuser takes them seriously and uses our superior technical services program to respond, investigate and correct issues in a timely and thorough manner." – Weyerhaeuser

"In the past, we would run across these problems when the products were first introduced. But then the manufacturer has to go back to the drawing board and perfect the product. We have done that and we have not run across any of these problems for many years. Whether you run into these problems really depends on the manufacturer and how they have evolved in their knowledge and experience in making the product.

Our experience is that very high percentages of recycled fiber can create a higher incidence of copier machine jams because recycled fibers are weaker than the equivalent virgin fibers. You don't see that with 20-30% recycled content. The higher amount of recycled content is more likely to result in a higher incidence of jams on complex processes, such as duplexing. On simple processes such as simply copying, even the 100% recycled is fine.

Still, there are ways to compensate for weaker fibers in the manufacturing process, such as by using softwood virgin pulp or by using a higher basis weight, e.g. 20.5 lb. instead of 20 lb. While there can be more risks of runnability problems with high recycled content papers, that has not been our experience, even with our New Life DP 100, because we have found ways to compensate for any initial fiber weaknesses." – Gerry Zampini, Vice President, Sales and Marketing, Cascades Fine Paper

"Higher-speed equipment, higher postconsumer content paper and older equipment can all affect the runnability. High-speed equipment and older equipment need to be properly serviced to achieve ideal performance. If preventive maintenance is not scheduled, runnability of any paper cannot be guaranteed. In regards to the postconsumer content, we feel this should not be a deterrent to runnability in the above equipment." – Domtar, Inc.

"Our experience is that a machine will get 'accustomed' to a paper over time, and variability is a contributing factor to problems. Recycled fiber is typically more variable. However, it is not my experience that the variability in the fiber translates into huge swings in product quality at the end user. We manage the fiber within our manufacturing process to help deliver a high-quality product to our customers that will deliver the performance they expect. If customers are switching back and forth between virgin and recycled papers, there may be jams – but not necessarily caused by the recycled fiber, per se. It may just be the machine needs to acclimate to the new paper, and once it settles in, the high performance returns. We offer field technical support to our customers to ensure that they have a positive experience with our office papers, including those with high recycled fiber content." – Vince Phelan, Director, Product Management and Marketing Communications, Boise Paper Solutions

LISTENING STUDY: Is there a problem with dusting generated by postconsumer content papers (which can impair the operation of optical sensors)? Or is dusting caused by something else altogether? Can higher postconsumer content create dusting, compared to lower postconsumer content papers?

"Paper dust will impair the operation of optical sensors in the imaging equipment used to detect jams. Most of the paper dust causing this problem can be related to finishing problems such as poor edge cuts and rough edges. These are housekeeping and maintenance problems that are independent of the recycled fiber content of the grades." – International Paper

"This problem is gone. Dusting was initially a problem with recycled papers years ago, but there has not been a complaint about dusting in the last 10-12 years. It is true that dusting is related to sheeter and slitter operations. It may be caused by improper surface treatment, but not specific to recycled papers." – Badger Paper Mills

"Dusting in end-use devices is generally related to sheeter cut/off quality, slit quality issues or dust removal system deficiencies. It may be influenced by total filler content or choice of surface treatment, but no more so for recycled papers than for virgin papers." – Georgia Pacific Paper

"No. I don't think there is a correlation between dusting and recycle content. Dusting is more likely due to high PCC [precipitated calcium carbonate] content or poor cuts on the paper. Stickies are more likely to occur in recycled paper than virgin." – Grays Harbor Paper, L.P.

"Dusting is an issue regardless of recycled content or not. Complaints of dusting could be caused by several factors:

- sheeting operations - for example, not properly being vacuumed,
- fiber coming loose from the sheet,
- filler, PCC [precipitated calcium carbonate] and other material coming loose.

Because there are these multiple root causes for dusting, each issue must be investigated on a case-by-case basis. Although recycled grades may contain a higher proportion of short fiber than virgin grades, all paper, whether recycled or virgin, is manufactured to strict standards aimed at minimizing dusting. Weyerhaeuser has not had significant issues with dusting in recycled or virgin grade papers." – Weyerhaeuser

"There should not be any reason for dusting. You can compensate for this, you can perfect the product. We have not run across any problems with dusting for the past 5-7 years.

The answer is better sizing to seal the paper better and compensate for any dust that could come from an alkaline paper. But this issue is the same for recycled or virgin alkaline sheets. You have to size the paper perfectly so that it is strong enough to keep the calcium carbonate from coming out. Recycled fiber is not a factor in dusting." – Gerry Zampini, Vice President, Sales and Marketing, Cascades Fine Paper

"We are not aware of any link between post consumer content and dust of woodfree [virgin fiber kraft process which removes lignin] business (copy) paper. Causes of dusting for paper in the application mentioned include: Poorly bound fibre/filler, Inadequate surface sizing, Excessive filler, Poor cut quality during converting, Poor internal sizing chemistry (ketone migration)." – Domtar, Inc.

"Dust comes from many sources, including surface debris, cut quality, slit quality, and other factors through the manufacturing process and the supply chain. Recycled fiber tends to be more variable and have less overall strength than virgin fiber, and this could result in some stray fibers coming free from the sheet. However, this is minimized by sizing applied to the surface of the sheet. As long as cut quality, slitter quality, and surface integrity are monitored on a regular basis and held within normal specification ranges, there should be no noticeable increase in dust for recycled vs. non-recycled papers." – Vince Phelan, Director, Product Management and Marketing Communications, Boise Paper Solutions

LISTENING STUDY: In querying copier equipment manufacturers, we heard a comment that paper sheets require long-grain fibers for structural stability, and there are too many short fibers in a sheet with greater than 30% postconsumer content, making that sheet less structurally strong. The comment suggested that higher postconsumer content is not problematic in packaging materials, but copiers are pickier in the kinds of paper they'll accept. Is that your experience as a paper manufacturer?

"While it is true that recycled fiber does contain somewhat more short fibers, our paper is manufactured to strict strength specifications. The furnish blend during manufacture is adjusted to meet the strength specifications. At the same time, the copier and laser printer manufacturers have made significant improvements in their paper paths, putting less of a structural demand on the paper." – International Paper

"Badger Paper obtains PCF postconsumer fiber from a consistent source which produces a good pulp with a excellent mix of short and long fibers. Problems which may be associated with a greater concentration of short fibers are not a problem with the Badger product because of the consistent mix of short and long fiber in the pulp mix used by Badger." – Badger Paper Mills

"This may be a specification issue with some manufacturers. We know the attributes that the paper needs to have to perform in the intended end-use applications, regardless of recycled content. Georgia-Pacific controls fiber and paper manufacturing processes to ensure conformance with these paper specifications." – Georgia Pacific Paper

"I don't think 30% is a magic number, but recycled fibers are less stiff than virgin, so other manufacturing adjustments must be made to equalize the stiffness." – Grays Harbor Paper, L.P.

"The relative amount of long fiber (softwood) and short fiber (hardwood or recycled fiber) used to make a sheet of paper is dependent on many factors, but must balance the ability to manufacture the sheet of paper and the performance of the paper in the end users' printers and copiers. In all cases, Weyerhaeuser uses furnish blends that produce paper that meets the end use requirements and the expected post-consumer recycled content." – Weyerhaeuser

"There are ways of compensating for the shorter fibers, including adding only 20-30% recycled and using more softwood." – Gerry Zampini, Vice President, Sales and Marketing, Cascades Fine Paper

"It is true that as post consumer content is increased some strength characteristics are negatively impacted. These include tear, tensile, elongation and stiffness to name a few. However these parameters are far less critical to the performance of copy paper compared to offset (web & sheet) stock. Long fibre is one of many parameters, which affect sheet stability. The key to having a stable sheet (acceptable curl) includes: Optimum fibre orientation, Proper moisture content, Optimum fibre length and morphology, Sheet structure (fines distribution), Surface sizing. Having long fibre length alone does not ensure problem free copier performance. Also of note, there are many types of post consumer fibres utilized in the making of recycled products. Recycled fibre from bleached OCC tends to have longer fibre length than mixed office waste paper." – Domtar, Inc.

"The percent of long vs. short fiber depends on the recycled pulp supplier and their process (especially the types of recovered paper that are inputs into the finished post-consumer pulp product). Our supplier provides us with adequate long-to-short fiber ratios to ensure a very high-quality finished product. In addition, the manufacturing process allows for more or less "refining" of the fiber going into the paper machine. Paper makers will make adjustments to their refining to compensate for average fiber length." – Vince Phelan, Director, Product Management and Marketing Communications, Boise Paper Solutions

LISTENING STUDY: In querying copier equipment manufacturers, we heard that recycled paper is less stiff than virgin, so it presents more of a challenge when duplexing. Is that your experience as a paper manufacturer?

"Our answer to the short-fibers question also applies to this question. Our recycled content papers are manufactured to strict stiffness specifications and perform as well as virgin papers in duplexing machines." – International Paper

"Badger's product has a proven history of successfully duplexing in copiers. Producing the proper stiffness of the paper required for duplexing is not a problem." – Badger Paper Mills

"This may be a specification issue with some manufacturers. We know the attributes that the paper needs to have to perform in the intended end-use applications, regardless of recycled content. The paper should be run to specifications that ensure performance in both simplex and duplex imaging. Georgia-Pacific recycled xerographic papers are run to the same stiffness specifications as virgin xerographic." – Georgia Pacific Paper

"Somewhat true if no manufacturing adjustments are made." – Grays Harbor Paper, L.P.

"There are several factors important to duplexing, including stiffness, dimensional stability and acceptable opacity. Factors such as ash content, caliper, fiber furnish blend and starch pick-up can affect these. Each paper machine must develop a grade recipe that allows them to produce recycled or virgin paper that meets the end user requirements for the factors important for duplexing, as well as for other strict specifications not mentioned above. The relative amount of ash versus fiber in the sheet is first determined by ability to meet end user requirements and then dependent on the capabilities of the individual paper machine and other site economics." – Weyerhaeuser

"We have not come across this problem with our papers. While it could be a problem of high recycled content papers, the manufacturer can solve it by compensating in the production process." – Gerry Zampini, Vice President, Sales and Marketing, Cascades Fine Paper

"Recycled paper typically is less stiff than virgin paper. However, the addition of long fibre in the making of recycled paper can compensate for the loss. Duplexing is not affected by stiffness alone. The key to having a stable sheet was mentioned earlier. One often-overlooked means of improving duplexing is simply to ensure that the paper is loaded with the correct side up in the feed tray. Paper makers induce a certain amount of curl in the sheet, which opposes the stresses imparted to the sheet in the fuser section of copiers." – Domtar, Inc.

"We have done studies of our stiffness and strength characteristics of 20# paper that had no post-consumer compared to those with 30% post-consumer. Although there may be slight differences, they were immaterial and did not affect the performance of the paper." – Vince Phelan, Director, Product Management and Marketing Communications, Boise Paper Solutions

LISTENING STUDY: In querying copier equipment manufacturers, we heard that dusting is caused primarily by inadequate vacuuming. Another reason papers dust more is that papers are now alkaline - rather than acid - based. We were told that an alkaline-based sheet requires less harmful chemicals, and is better for the environment, but an alkaline sheet accepts or absorbs more chalk and fillers in the papermaking process. That chalk residue sticks to the sheet after cutting, and is still on the sheet when it is fed into the copier, which contributes to a greater dusting factor. Therefore, dusting is more about alkaline vs. acid than about fiber content. As a paper manufacturer, what is your experience with dusting issues?

"'Dusting' can be caused by inadequate vacuuming during the sheeting process but it can also be caused by inadequate sheet surface sealing along with the edge cut issues discussed above.

The acid papermaking process used talc and clay as fillers while the alkaline based process uses chalk which is calcium carbonate. Calcium carbonate is brighter than talc & clay which promoted paper manufacturers to increase the amount of filler in the paper to produce an economical sheet that permanently stays white and bright. Since more filler is used in the alkaline process, it is important to make sure the surface of the sheet is sealed. Calcium carbonate is more abrasive on the slitters and knives used in the sheeting process, making it necessary to change them out more frequently to maintain a clean edge cut. If the sheet surface is not sealed properly and the sheeting process is not maintained, increased dusting can occur during imaging." – International Paper

"Alkaline sheets are brighter and longer lasting. Some issues regarding alkaline v. acid would affect offset printing paper applications, such as 'chalking,' but those issues have been

addressed between mills and press operators. But as far as office paper applications, alkaline paper allows for brighter and longer lasting paper." – Badger Paper Mills

"Our experience indicates that dusting in end-use devices is most influenced by the cutting and slitting capability of the conversion process and the effectiveness of the associated dust removal system. Initially, as manufacturers began producing alkaline papers, most experienced issues with more rapid knife dulling than with acid-base fillers. Most manufacturers resolved these issues by making the slitting, cutting and dust removal systems more robust." – Georgia Pacific Paper

"True. I would say it's more about alkaline vs. acid, and poor slitting, or cutting of paper." – Grays Harbor Paper, L.P.

"Whether the paper is alkaline or acid depends on the type of filler used and what pH the paper is run to. Clay is more commonly used in acid-based papers, while ground calcium carbonate (GCC) or precipitated calcium carbonate (PCC) filler are more commonly used in alkaline. Alkaline paper is beneficial for archival value and for using filler content such as PCC for brightness, opacity and cost-effective paper production. Today, in fact, it would be very expensive to make acid-based uncoated copy paper. The issues of acid- vs. alkaline-based paper production are very complex and really depend on the type of paper being produced. Whether a sheet is manufactured under alkaline or acid conditions, dusting can still be an issue." – Weyerhaeuser

"There should not be any reason for dusting. You can compensate for this, you can perfect the product. We have not run across any problems with dusting for the past 5-7 years.

The answer is better sizing to seal the paper better and compensate for any dust that could come from an alkaline paper. But this issue is the same for recycled or virgin alkaline sheets. You have to size the paper perfectly so that it is strong enough to keep the calcium carbonate from coming out. Recycled fiber is not a factor in dusting." – Gerry Zampini, Vice President, Sales and Marketing, Cascades Fine Paper

"The advantages gained by converting to the alkaline process are very well documented. Archival benefits, higher brightness and whiteness, improved fibre bonding, smoother surface, etc. Along with these advantages came the requirement to improve the converting (sheeting) process. Most of the benefits noted above resulted from the ability to increase the filler (calcium carbonate) content. Higher filler levels increase abrasion tendencies. Sheetting equipment had to be modified to ensure that high cut quality was maintained. Most converting units are equipped with vacuum systems to further ensure that cut edge debris is removed from the sheet." – Domtar, Inc.

"Dusting is attributable to the factors I mentioned above. I would not characterize it as 'inadequate vacuuming' in that we don't vacuum our paper. Alkaline papers use different filler materials, and they can be harder on knife surfaces. Most paper mills switched to alkaline many years ago, and as they did so, they learned how to reduce surface dust and converting dust (by updating knife maintenance schedules to accommodate the new filler materials in the sheet). Today, there is very little difference in dust in the end product between alkaline and acid office papers." – Vince Phelan, Director, Product Management and Marketing Communications, Boise Paper Solutions

LISTENING STUDY: In querying copier equipment manufacturers, we were told that the shorter fibers in higher postconsumer papers cause the paper to curl more frequently in the heat of the copier process. As a paper manufacturer, what is your experience with curling?

"In the past, groundwood was used to produce the higher recycled content in the paper. Groundwood is very reactive to heat and caused a high degree of post-image curl when the sheet was used in equipment with fuser sections. Again, the furnish is adjusted to ensure the post-image curl of the sheet is within an acceptable range. The curl in paper containing recycled fiber has more to do with the hardwood to softwood ratio, the 'cutting' and 'brushing' of the fibers, the alignment of the fibers and the drying of the sheet during manufacture than the actual recycled content. Short fibers, either hardwood or those made by chopping up the long softwood fibers, produce a sheet with better formation but increases post-image curl. A very delicate balance must be maintained between fiber lengths, amount of filler, fiber processing and drying to produce a low curl high formation sheet." – International Paper

"The key to making a quality paper, and preventing such issues as excessive curl, is creating the proper mix of both short and long fibers. Our manufacturing focuses on the positive benefits derived from both short and long fibers, and balances that with drawbacks related to too much of one type. Additionally, due to the consistent source of Badger's pulp, improper fiber blend is not an issue." – Badger Paper Mills

"Curl is generally related to the paper manufacturing drying processes, moisture targets, fiber orientation and other factors not related to recycled fiber content. G-P recycled xerographic papers have the same curl specifications as virgin xerographic papers." – Georgia Pacific Paper

"Curl of paper is more due to unequal top to bottom fiber distribution during the forming process, and unequal top to bottom drying of the paper. Paper with less stiff fibers are less resistant to curling due to heat and moisture changes to the paper." – Grays Harbor Paper, L.P.

"Curl is complex and is mostly related to fiber orientation, moisture content and drying strategy. Fiber furnish, including recycled content, tends to be a minor factor in poor sheet curl performance." – Weyerhaeuser

"Recycled fiber has nothing to do with curling. Curling is caused by too much moisture. If the paper has too much moisture, it may curl, but that is not a problem we have run into with recycled papers." – Gerry Zampini, Vice President, Sales and Marketing, Cascades Fine Paper

"Optimum fibre length is only one of the parameters required to having a curl free sheet. Excessively long fibre can be detrimental to curl due to the fact that softwood fibres (long) typically have higher coefficients of moisture expansion. It is more important to strive towards top and bottom sides of the sheet that are similar in structure and composition. This will ensure that the shrinkage of the fibres on the topside of the sheet will be more or less equal to the shrinkage of fibre on the bottom of the sheet, thus minimizing curl during toner fusing." – Domtar, Inc.

"Office papers are constructed to reduce the amount of curl that will occur in the copying process. Fiber alignment, moisture, and other physical characteristics will affect curl. As mentioned previously, the fiber length issue can be managed. Our experience is that recycled papers will not curl any more or less than non-recycled papers as long as they are designed and

engineered for the intended end use of copying." – Vince Phelan, Director, Product Management and Marketing Communications, Boise Paper Solutions

LISTENING STUDY: Have you done any tests or studies on the performance of your company's copier/laser/ink jet paper in office equipment?

"International Paper has dedicated much technical knowledge, time, and money to the goal of making a sheet containing recycled fiber that performs as well as a virgin sheet in copy quality and runnability. Our end-use product performance testing confirms that our current recycled grades do meet the same high standards for print quality and runnability as our virgin grades do. Extensive copier and laser printer testing is performed continually at the mill of manufacture as well as the main Media Evaluation Lab to ensure the recycled and virgin grades continue to deliver excellent print quality and runnability meeting our high quality performance guarantee. Purchasers of our products are welcome to inquire about the performance of our products, and requests are handled on a case-by-case basis." – International Paper

"Badger Envirographic 100 and 50/30 have been on the federal government's GPO/GSA qualified paper list for a number of years running. That should speak for itself." – Badger Paper Mills

"There have been past studies, such as one sponsored in the mid-90's by the "US Conference of Mayors," in which recycled content paper was evaluated in Canon, HP and other digital printing papers (early '98). Additionally, G-P has worked with Buyer's Lab in Hackensack NJ, the leading independent office products testing lab in the US, to characterize the performance of our recycled papers vs. virgin paper in a wide range of devices. The results of those evaluations confirm that G-P's recycled xerographic papers perform equivalent to our virgin xerographic papers.

G-P routinely evaluates end-use performance of our xerographic papers both with in-mill end-use devices as well as third party evaluations such as the "Buyer's Lab" study referenced above. The results of these evaluations are generally considered confidential and not accessible by those outside of Georgia-Pacific." – Georgia Pacific Paper

"Weyerhaeuser papers are tested, but we do not have test results that could be cited or published. However, in general, while it is true that a mill would have to compensate for the fact that the fiber strength of recycled is lower, mills are aware of this and know how to formulate papers so they perform well." – Weyerhaeuser

"Our paper is tested at the mill and then tested outside the mill. We sell on a day-to-day basis. We don't produce any virgin copy paper so our recycled paper is competing head-on with the virgin copy paper of other manufacturers. Yet we have been oversold for the past two years and are looking at adding capacity to produce more recycled cut-size papers.

Making recycled paper has never prevented us from selling and marketing our product. In fact, we present the recycled features in our papers as advantages.

We have met and overcome the problems that used to exist in the 1980s such as jamming, curl, and frailty of the fiber. We have learned to correct our production methods to avoid all those problems. None of the complaints we hear now have to do with the recycled fiber in our papers. They're only to do with occasional mill issues like rolls not wound properly. But recycled content presents no problems." – Gerry Zampini, Vice President, Sales and Marketing, Cascades Fine Paper

"Yes we perform daily performance testing of copy paper in copiers and laser printers. We occasionally test our product in commercial high-speed copiers. Access to this data will be determined on an individual basis." – Domtar, Inc.

"We have conducted third-party testing of our Aspen 100 product, and we have provided copies of those reports to our prospective customers. We have, from time to time, also provided limited quantities of free paper for trialing within our customers' operations to validate performance." – Vince Phelan, Director, Product Management and Marketing Communications, Boise Paper Solutions

COPIER SERVICE TECHNICIANS

We interviewed technicians who service copiers when problems arise. These included both companies that contract for service and maintenance, sending a technician to the workplace when necessary, and also manufacturers that bring the machines back to their own facilities for repair.

Following the Paper Trail, the Canadian Aurora Institute/Reach for Unbleached study to be published summer 2003, found that, "While at least 40% of respondents had heard no complaints about recycled/chlorine free papers in the office environment, of those who had heard critiques, fully 43.5% of complaints had come from office machine maintenance technicians or distributors."

LISTENING STUDY: What is your experience with the use of recycled papers in copiers and printers?

"Recycled paper represents a relatively small percentage (we estimate approximately 5%) of all paper used in Xerox equipment.

Xerox's Media Technology group tracks inquiries/complaints from owners of Xerox equipment having difficulty with paper and other media. Complaints about Xerox papers are tracked separately from those for competitive (i.e. non-Xerox) papers.

With respect to Xerox papers, we have not seen a disproportionately high level of customer dissatisfaction with recycled paper. Complaints about Xerox recycled paper account for less than 1% of the complaints received year-to-date for all Xerox papers. The proportion of complaints attributable to recycled paper is lower than the proportion of total paper use accounted for by recycled paper.

By contrast, recycled paper does account for a somewhat disproportionately high percentage of complaints from customers running competitive papers in their equipment. Although we estimate recycled paper represents only 5% of total paper used, more than 10% of all complaints about competitive paper handled year-to-date are attributable to recycled paper." – Elizabeth Graves, EH&S Regulatory Affairs Manager, Xerox (Note: Xerox's responses in this section are based on the experiences of Xerox paper engineers and service technicians working with Xerox customers in the United States.)

"My experience is 100% postconsumer tends to jam. The chemicals used to hold it together make the paper slip in the system; chemicals transfer to rollers and increase the number of service calls but the paper does not damage the machine. 30-50% postconsumer works fine.

USA Standards for paper (weight, paper content, brightness, hue, chemicals in paper production) are much higher than other countries. Papers from other countries that are cheaper may not have the same reliable quality." – Mike Campbell, Service Manager, Central Business Equipment, Albany, NY (Note: CBE services Minolta and Toshiba copiers.)

"Generally avoid it if we can. Some customers use it regardless." – Ikon Office Solutions, NY (Note: Ikon services Canon and Ricoh copiers.)

"I generally suggest not to use it, probably due to old experience. You'll find it's an industry thing. Some guy will complain he just spent a ton of money on the recycled. I tell my clients, 'That's not my problem; I'm just telling you what I know will work.'" – Ikon Office Solutions, VA (Note: Ikon services Canon and Ricoh copiers.)

"Very good experience, no major issues. It's part of our testing procedure.

Along with the workgroup machines, internal data center machines are highest users of recycled paper. We test those machines to run all the 'regular' commodity papers.

Internal recycled paper use is higher than at an external copy/print shop—print per payment is usually on glossy or other specialty paper." – Kurt Swanke, Konica Business

Technologies, Windsor, CT (Note: This facility builds and repairs Konica copiers. Not able to confer with company engineers on some points.)

LISTENING STUDY: If you think there is a problem with using recycled paper in copiers, can you explain why that problem exists? What characteristics of the recycled paper are problematic?

"The complaints that Xerox has received year-to-date for competitive (i.e. non-Xerox) recycled papers are linked to two problems. The most common issue is excessive contamination or dirt that negatively impacts image/print quality. A second issue is excessive paper curl that impacts runnability (i.e. causes paper jams).

Xerox has long recognized these potential quality issues with recycled paper. To address them, we've established for Xerox recycled papers the same stringent performance and reliability specifications that apply to their virgin counterparts. These specifications establish acceptable ranges for paper dust, curl, paper static and poor cut quality to ensure optimum runnability. Although laboratory tests indicate a slightly higher degree of curl in Xerox recycled papers compared to virgin papers, both types of paper are well within the acceptable range for curl defined by Xerox specifications, and demonstrate equivalent runnability performance in customer equipment.

The problems of excessive curl and contamination are quality issues related to the paper manufacturing process. Recycled papers, just like virgin papers, vary from high- to low-quality in terms of print quality and runnability. Producing a quality paper requires papermakers to establish strict performance specifications and to control the variability of the papermaking process to meet these specifications consistently -- regardless of the production run, or the paper machine or mill making the paper.

Recycled paper – a mix of fibers from many different sources – is inherently more variable than a virgin sheet made from a more limited number of fiber types. This added variability in recycled paper makes it more challenging for a papermaker to control the paper's curl. An important factor is the "drainage" on the paper machine (how the wet papermaking solution forms the paper web). The ability to uniformly control drainage is important for making a consistently high-quality, low-curl paper – recycled OR virgin.

A specific problem unique to recycled paper are the "stickies" (adhesive and plastics) which can build up on the paper-making machines (causing holes and inclusions in the paper, degrading its quality) and on copying/printing equipment (causing spots on the photoreceptor, which in turn causes poor print quality). The higher dirt level in recycled paper may also be objectionable to customers seeking premium image quality." – Elizabeth Graves, EH&S Regulatory Affairs Manager, Xerox

"Seems to be dustier, seems not to pick up out of the cassettes as well as other paper; seems to be a lot of variability. From my experience I don't know what type of recycled paper would run better or worse." – Ikon Office Solutions, NY

"Rag content is getting in the machines. Chemicals in recycled paper react differently to the electricity. There is higher dust content. I was told in '83 to stay away from it. I've passed on the info to people I've trained.

Moisture content is important. Dry paper and the toner gets thrown around. My advice to clients is often, 'Buy a better paper and stay away from the recycled.'" – **Ikon Office Solutions, VA**

"I've heard when papers with higher than 50% postconsumer are used, something happens — when humidity is involved there are issues. I haven't heard of any customer problem with recycled content with our machines.

When customers cut the paper themselves, they create jams. We don't print workgroup machine paper specs." – Kurt Swanke, Konica Business Technologies, Windsor, CT

LISTENING STUDY: If you think there is not a problem using recycled paper in copiers, why do you think many people blame recycled paper for runnability problems?

"We believe that low-quality recycled papers, just like low-quality virgin papers, cause runnability problems in copying and printing equipment. Unfortunately, customers' experience with low-quality recycled papers may have created a misperception that all recycled papers are of low-quality and cause paper jams.

As stated above, Xerox recycled papers are able to achieve the same performance and reliability levels of Xerox virgin papers. Overcoming misperceptions among the general public regarding the quality of recycled paper, however, is a long-term effort." – Elizabeth Graves, EH&S Regulatory Affairs Manager, Xerox

"People expect all recycled papers to run as well as the virgin. Paper is totally different from one brand to another. Some brands consistently work well. I've never had problems with Great White. Great White is what is recommended for our machines." – Mike Campbell, Service Manager, Central Business Equipment, Albany, NY

"I'm not sure about that. You'd have to separate that from one kind of copier to another - analog vs. digital. Duplexing is done differently now. With analog machines, the paper would copy one side and stack up before printing the opposite side, creating static and jamming problems with any paper. The digital copiers duplex one page at a time, greatly reducing the problem. I think that's an across the board issue." – Kurt Swanke, Konica Business Technologies, Windsor, CT

LISTENING STUDY: Do your service technicians caution customers against the use of recycled paper in the machines they service? Does your company have a policy to caution customers against the use of recycled paper in copiers? If so, could you provide us with a copy of that policy?

"Xerox does not have a policy to discourage the use of recycled paper in our copying and printing equipment, nor do our service technicians discriminate against its use. Our service technicians' goal is to maximize the 'uptime' of Xerox equipment to satisfy our customers. To this end, service technicians promote the use of high-quality paper over low-quality paper (as opposed to promoting virgin paper over recycled paper).

The same approach to solving problems with defective papers is followed regardless of whether the paper is virgin or recycled – the primary focus is making every effort to help

customers use their paper of choice. If a customer reports a runnability problem with a competitive paper, a Xerox service technician recommends that the customer try another batch number or brand of paper. For example, if the problem paper contains recycled content, the service technician would recommend the customer try another brand of recycled paper (as opposed to recommending a switch to virgin paper).

If a customer reports a print quality problem, a service technician evaluates a machine's set-up, the quality of the machine's imaging components, and the paper being used. In some cases handled year-to-date, this evaluation has shown that a low-quality competitive recycled paper is causing the image quality issue (high adhesive/plastic content in the paper builds up on the photoreceptor, producing spots on copies/prints). In these cases, the technician presents the results to the customer. It is the customer's decision to continue using the paper or not, recognizing the implications to print quality." – Elizabeth Graves, EH&S Regulatory Affairs Manager, Xerox

"We do not caution them against using it or have a policy against recycled. We inform them of the possibility of premature failure due to the use of high post-consumer content paper. Premature failure means a higher frequency of service calls due to the cleanliness of the inside of the machine caused by paper chemicals leaching to rollers as noted above." – Mike Campbell, Service Manager, Central Business Equipment, Albany, NY

"Not if there are no problems. There's no policy. If we have a customer who is using recycled paper and continuously calling in with problems related to jams/dusting/spots and the machine meets the correct mechanical and electrical specifications, we'll take a known virgin paper and if it runs fine then we'll identify the recycled as the culprit. There's no training process by the manufacturers to identify this type of problem." – Ikon Office Solutions, NY

"No policy. A technician in the field for 10 years – if he spots a problem, he'll put new, virgin paper in and if it works fine, he'll point to recycled paper. We don't use anything refurbished. Parts or otherwise." – Ikon Office Solutions, VA

"No, that may come in the pre-sales area, from a copier salesperson, but not during regular service from a service technician. We don't sell paper." – Kurt Swanke, Konica Business Technologies, Windsor, CT

LISTENING STUDY: We've heard from several end users that they're afraid to use recycled paper because it would void their copier warranty. Do you know of any warranty language which prohibits or limits the use of recycled paper in office equipment? (We've asked copier manufacturers if this is the case, and all of them said they didn't have language specifically prohibiting the use of recycled paper in their copiers.)

"Xerox warranty language does not prohibit the use of recycled paper in copying or printing equipment. As mentioned above, if a customer reports a runnability problem with a competitive paper, a Xerox service technician recommends that the customer try another batch number or brand of paper. If a customer continues using a problem material, Xerox might consider subsequent service calls related to the problem material to be outside of the customer's service contract (and the service calls would be an additional charge to the customer)." – Elizabeth Graves, EH&S Regulatory Affairs Manager, Xerox

"No warranty is voided; they cover recycled paper. The machines are guaranteed to run recycled paper." – Mike Campbell, Service Manager, Central Business Equipment, Albany, NY

"Not sure; it's only a remote possibility from the manufacturers. Personally we are very lenient with that. It's darn near an impossibility to prove that what someone put through the machine was responsible for breaking an expensive part. I've never voided a warranty." – Ikon Office Solutions, NY

"No, it won't void warranties." – Ikon Office Solutions, VA

"I don't know of any. We do test it. Paper information is in every users guide." – Kurt Swanke, Konica Business Technologies, Windsor, CT

LISTENING STUDY: Some users have reported experiencing runnability problems with recycled paper in their machines. Often, they link these difficulties to higher-speed equipment, higher post-consumer content paper, or older equipment. Do you have any experience or comments on whether any or all of those factors contribute to runnability problems?

"These are not issues with Xerox papers. As previously mentioned, Xerox recycled papers – regardless of their level of recycled content -- are qualified to the same performance and reliability standards and carry the same guarantee as comparable Xerox virgin papers." – Elizabeth Graves, EH&S Regulatory Affairs Manager, Xerox

"Yes, high-speed equipment does need to run a better grade of paper than a slower copier. I would recommend no higher than a 30% pcc and your brand of paper does matter." – Mike Campbell, Service Manager, Central Business Equipment, Albany, NY

"I've never isolated it in that fashion." – Ikon Office Solutions, NY

"At our higher speed (where the machine footprint can be larger), we've made the paper path as straight as possible. In machines running 50 ppm (pages per minute) and up, the paper only makes one turn, reducing reliability problems for all paper. This change has occurred in the past five years. Papers for color copying have more problems due to the high moisture content." – Kurt Swanke, Konica Business Technologies, Windsor, CT

LISTENING STUDY: Is there a problem with dusting generated by higher post-consumer content papers (which can impair the operation of optical sensors)? Or is dusting caused by inadequate vacuuming of the sides of the paper after cutting it? Or is dusting caused by something else altogether?

"Because Xerox recycled papers must meet the same stringent dust and contamination specifications as Xerox virgin papers, Xerox recycled papers do not present a dusting problem." – Elizabeth Graves, EH&S Regulatory Affairs Manager, Xerox

"Dusting is not really the problem but the chemicals transferring to the rollers. There's a cleaning system in the machine to take care of dusting. If the service tech isn't keeping track that could be a problem. But I haven't had a problem with that." – Mike Campbell, Service Manager, Central Business Equipment, Albany, NY

"I don't know. It could be after the cutting. It just seems to have a higher dust content. Something used to hold the fibers together possibly--just dusting from the paper sliding over itself." – Ikon Office Solutions, NY

"Industry rumor—more with carbonless paper. That rumor has probably reduced recycled paper users. We haven't experienced that problem that I know of, especially in the last 5 years."
– Kurt Swanke, Konica Business Technologies, Windsor, CT

RECYCLED PAPER LISTINGS

In addition to each paper manufacturer's and distributor's website, there are a number of national sources for listings of recycled copy and office paper options. Many state and local governments also include regional listings on their websites.

Conservatree's Environmentally Sound Paper Listings – Lists printing and writing papers available in North America (including imports), along with environmental attributes that have been verified by mill personnel

<http://www.conservatree.com/paper/PaperGuide/Copy.shtml>

California Integrated Waste Management Board Recycled-Content Product Database – Search using the "CIWMB Standard Product Categories." Results may not be complete if you use other terminology. Listings are a mix of manufacturers and distributors, some national, others local to specific regions of the country. The list is North America-wide, not only California.

<http://www.ciwmb.ca.gov/RCP/>

Green Seal's Choose Green Report: Copy Paper – link to PDF in the middle of the page at the following URL

<http://www.greenseal.org/recommendations.htm>

U.S. Environmental Protection Agency – The categorizations on this list are very general, some of the listings are extremely outdated, and the state sorts are incomplete and inadequate. Use the general (non-state) sort and then check for those papers with local suppliers.

http://www.ergweb2.com/cpg/user/cpg_search.cfm

U.S. Government Printing Office (GPO) - Lists brand name copy papers that have been tested by the GPO and were determined to be in compliance with the requirements of the JCP O-65 paper standard

<http://www.access.gpo.gov/qualitycontrol/cpypaper.html>

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