



# GREEN

GREEN SEAL'S

*Choose*

## OFFICE SUPPLIES

- 1.6 million single-use pens are discarded each year in the United States.
- 24 trees are cut down to make a ton of (virgin) printing and office paper.
- A ton of paper made from 100 percent recycled paper, as compared to virgin paper, saves the equivalent of 4,100 kilowatt-hours of energy, 7,000 gallons of water, 60 pounds of air emissions, and 3 cubic yards of landfill space.
- About 15 million pounds of polyester transparency film are discarded in the United States each year.
- By sending their printer and copying cartridges for remanufacturing, U.S. businesses could save \$1.5 billion and at least 100,000 barrels of oil annually.



**T**he U.S. market for office supplies is huge, currently generating about \$50 billion in retail sales each year, with online sales steadily gaining increased market share. Office products encompass a wide variety of manufactured goods made from different materials, including paper, plastics, steel, and others, so the environmental impacts from their production, use, and disposal are equally wide-ranging. Office supplies require raw materials (both renewable and non-renewable) and energy for production, generate air and water pollution and solid and hazardous wastes during manufacturing, and become solid waste when discarded. Some may also contain hazardous materials that can affect the user if handled improperly.

Two-thirds of U.S. businesses have policies on recycling, but only 40% have policies regarding the purchase of recycled materials.

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The market now offers a variety of office products

containing high recycled content and using non-toxic materials. In fact, a number of office product superstores and other

wholesalers/distributors are putting increased emphasis on environmentally preferable products and, in some cases, have entire Web sites devoted to “green” office products. This report addresses the following products:

- Binders
- Clipboards
- Highlighters, markers, and correction fluid
- Envelopes (large)
- File folders
- Index cards
- Labels
- Pens and pencils
- Presentation transparencies
- Self-stick notes
- Toner cartridges

The products are grouped into categories below. Paper-based office products, for instance, have been grouped together because of the common issues they involve. Paper has been the focus of several earlier *Choose Green Reports*. A November 1999

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*Choose Green Report* covered printing and writing papers, and another one in January-February 2000 addressed copy paper. An April/May 1998 *Choose Green Report* focused on alternative fiber papers.

## Greening Your Office *Practice the 3 R’s*

Practicing the 3R regimen advocated by the Reduce-Reuse-Recycle hierarchy will help you achieve the dual objectives of resource conservation and waste minimization, both of which contribute to a cleaner, healthier environment.

### *Reduce and Reuse— Use less stuff!*

Most of the environmental impacts of office supplies occur during the extraction of the materials for the products and in manufacturing processes, which use natural resources and energy and generate wastes, including solid and hazardous wastes. Toxic chemical releases from the plastics industry totaled over 107 million pounds in 1999; more than 228 million pounds were released from the paper industry; and metal mining released more than 3.9 billion pounds. Although office supplies manufacturing represents a small portion of these overall impacts, your office can do its share to reduce these extraction and manufacturing impacts by:

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- simply using less by conserving office supplies;
- reusing products—have a reuse area for surplus office supplies to be deposited;
- donating unwanted supplies to schools or charitable organizations;
- reusing intraoffice envelopes; and
- minimizing packaging by asking for reusable shipping containers for delivery of office supplies to your office.

### *Reduce and Reuse— Buy reusable, recycled and non-toxic*

This report focuses on green purchasing and recommends purchasing office supplies made of recycled and non-toxic materials to reduce environmental impacts in the extraction of raw materials and in manufacturing. Non-toxic materials also protect office workers. Your office can do its share by:

- buying reusable and refillable products;
- seeking out remanufacturable products;
- stipulating high recycled content;
- purchasing products without toxic solvents; and
- avoiding paper products bleached with chlorine.

The U. S. EPA has issued Comprehensive Procurement Guidelines for many of the products discussed in this report based on their recycled content (see [www.epa.gov/cpg](http://www.epa.gov/cpg)). Green Seal™ has taken these guidelines into account in this report. For Federal purchasers, the U.S. General Services Administration’s *Environmental Products and Services Guide* (see [www.gsa.gov](http://www.gsa.gov)) lists a number of products that comply with the CPG and may also comply with our criteria.

## ***Recycle—minimize solid waste***

Commercial and industrial waste contributes anywhere from 35 to 45 percent of the total municipal solid waste generated currently in the United States, amounting to about 100 million tons each year. Your office can do its share to reduce this waste by:

- making sure an effective recycling system for paper is in place and is used;
- recycling corrugated packaging; and
- planning ahead for office moves to avoid massive disposal of otherwise reusable and recyclable items.

## ***Clipboards*** ***Buy Recycled!***

A clipboard provides a hard surface for writing, with the clip securely holding the paper in place. Clipboards are made of many materials, including plywood, fiberboard, pressboard, and hard plastic. Though plastic production relies heavily on petroleum (a non-renewable resource), clipboards made of 100% post-consumer plastic are now available and offer certain advantages. Plastic boards are durable and, thus, need to be replaced less frequently. Moreover, the purchase of products containing post-consumer plastic puts the material to good use and prevents it from being landfilled. Also, the manufacturing impacts of recycling plastic are much less as

compared with the production of virgin plastic.

## **Highlighters, Markers, Correction Fluid**

### ***Buy non-toxic, water-based!***



Highlighters, markers, and correction fluid are products found commonly in every office. Exposure to the hazardous substances that some of these products contain can occur from ingestion, inhalation, or absorption through the skin. There are basically three kinds of markers: water-based, alcohol-based, and aromatic solvent-based. Aromatic solvent-based are the most hazardous; many use xylene or other aromatic solvents, volatile organic compounds (VOCs) that have a characteristic solvent odor that can cause toxicity to the nervous system as a result of overexposure. Normal use generally will not result in toxic effects; however, Green Seal™ recommends avoiding any exposure to toxic materials if suitable substitutes are available. Alcohols are also volatile solvents, but they are generally not as toxic as aromatic solvents.

Here are some tips for purchasing safer and less polluting alternatives:

- Use water-based markers instead of solvent-based whenever you can. Most permanent markers are solvent-based; however, some new “low-odor” products are on the market. For

most purposes, non-toxic, water-based markers can be substituted for permanent or waterproof ink. An extra benefit of water-based markers is that they are much easier than solvent-based markers to clean up from walls, woodwork, skin, or clothing.

- Markers for highlighting are usually water-based. Choose refillable markers, if available.
- Fine-point pens are less hazardous than wide-point markers because they do not apply as much ink to the paper or release as much solvent into the air.
- Dry-erase markers come in two types: alcohol or ketone based. Choose the alcohol-based kind, marked as “low odor.”
- Make sure the product is certified by the Art and Creative Materials Institute (ACMI) or otherwise conforms to ASTM D-4236, a chronic-hazard labeling standard that is part of Federal law, the Labeling of Hazardous Art Materials Act (LHAMA). Products found to be safe in a toxicological evaluation by ACMI carry the “AP” (approved product) or other non-toxic seal of approval.

Correction fluid may also contain organic solvents—1, 1, 1-trichloroethane, for instance, which is an ozone-depleting substance. These solvents are generally safe during normal use, but overexposure can cause central nervous system disturbance and respiratory irritation. Correction fluid formulations containing water, instead of 1,1,1-trichloroethane, are becoming increasingly

available, with perhaps only a marginal increase in drying time. Make sure the correction fluid you buy is water-based and non ozone-depleting. Some varieties of Liquid Paper (a popular brand of correction fluid) have statements on them claiming that the products will not deplete the ozone layer and are in compliance with Proposition 65.<sup>1</sup>

Alternatives to correction fluid include non-toxic, non-liquid, crayon-type pens that cover the print and do not bleed through the paper; and correction tape and correction film, which release less solvent vapors when used than traditional correction fluid.

## Paper-based Office Products

### *Buy recycled, chlorine-free!*

Labels, index cards, binders, file folders, and self-stick (Post-it®) notes are traditionally made of paper. Paper manufacture using virgin pulp consumes trees and is highly water intensive, energy intensive, and polluting. Primary concerns associated with paper

*The pulp and paper industry is one of the largest and most-polluting industries in the world.*

manufacture include the use of chlorine-based bleaches and the resultant toxic emissions to air, water, and soil. The

pulp and paper industry is one of the largest and most-polluting industries in the world; it is the third most-polluting industry in North America. The chlorine used in bleaching results in the formation of chlorinated organic compounds, such as dioxins and furans. Extensive research has shown that exposure to dioxins and furans can result in biochemical and biological effects in animals and humans. The dioxin generated in conventional papermaking resists biological breakdown and accumulates in waterways, waste sludge, and the tissues of fish downstream from the paper mills. This contamination of fish can affect humans as it propagates up the food chain. Trace quantities of dioxin have also been found in the paper goods themselves.

The use of paper-based products that are chlorine-free and contain a high percentage of post-consumer recycled fiber reduces many of the burdens typically associated with paper production. Paper is termed “elemental chlorine-free” when derivatives of chlorine such as chlorine dioxide are used for bleaching instead of elemental chlorine, but the best products are those where chlorine use is avoided altogether by using alternatives such as oxygen, hydrogen peroxide, or ozone or by not bleaching at all.

Alternative fibers for paper production, such as kenaf, hemp, or bamboo, sometimes do not require bleaching with

chlorine or chlorine compounds. While these fibers reduce the demand for tree harvesting, their cultivation does result in environmental impacts, such as energy, water use, and soil erosion. Because their cultivation results in more fiber per acre, these impacts are generally lower than growing trees. The transportation of these fibers over long distances also results in environmental impacts, so look for paper from fibers grown nearby, if available.



### **Binders**

Binders are made from many different materials, ranging from cardboard to plastic. They may be

either a paper-covered or plastic-covered paperboard core, or they may be solid plastic. Binders made from 100% post-consumer recycled cardboard are available. The plastic covering over cardboard or fiberboard cores is usually polyvinyl chloride (PVC), while solid-plastic binders can be made from high density polyethylene (HDPE), polyethylene terephthalate (PET), or other plastics. HDPE and PET are commonly recycled in municipal recycling programs, and binders made from 100% post-consumer recycled PET (from soft drink bottles) are available. PVC, a commonly used plastic, is produced from vinyl chloride monomer, a potent human carcinogen. PVC also contains stabilizers, such as lead (a toxic metal), and also contains plasticizer chemicals (usually phthalates) that may be released into the indoor environment. Moreover, if PVC binders are incinerated without

<sup>1</sup> Proposition 65 refers to The Safe Drinking Water and Toxic Enforcement Act of 1986, a California act resulting from a statewide referendum that requires the Governor to publish a list of chemicals that are known to the State to cause cancer or reproductive harm and requires producers to warn of their presence in products.

adequate controls, PVC can release dioxins, compounds that are potent carcinogens and can cause immune system damage. PVC, however, can be recycled, reducing these impacts, and recycled content PVC binders are available.

For each of these materials, binders are available with recycled content. Green Seal™ recommends that solid plastic and cardboard binders contain 100% post-consumer recycled content. If these do not suit your needs, Green Seal recommends that if you use PVC-covered paperboard binders, the cover contain at least 25% total recycled content and the paperboard core be at least 90% total recycled content with 75% post-consumer.

### ***Self-stick Notes***

The serendipitous discovery of an easily removable adhesive by a research scientist at 3M thirty years ago has led to the development of the ubiquitous product we now know as “Post-it” notes. A repositionable acrylic adhesive provides the “stickiness” to a Post-it note, giving it its characteristic ability to stick and re-stick over and over again. The notes are convenient to use and often result in minimizing paper use (because they are small in size and can be used several times before being discarded). With other competing brands now available, it is important to pick the one with the highest overall recycled content and highest post-consumer content.



Because of the adhesive and the multiple colors, self-stick notes are usually not suitable for recycling in high-grade office paper recycling systems. They can usually be recycled with mixed paper, however.

Green Seal recommends purchasing self-stick notes that are made from 100% recycled paper and contain at least 30% post-consumer material.

### ***Envelopes— How about unbleached and recycled content?***

In addition to paper envelopes that are widely used today, envelopes made of Tyvek® are used by FedEx and other shippers because they are lighter and stronger than paper. The lighter weight of these envelopes translates directly into fuel

*The lighter weight of Tyvek® envelopes translates directly into fuel savings.*

savings, which is particularly important in the case of long-distance shipments. Both aviation fuel and motor gasoline are made from petroleum, a non-renewable natural resource. Reduced dependence on petroleum is a critical goal of current global research and environmental policy making.

Tyvek® is made by DuPont from very fine, high-density polyethylene fibers. The fibers are flashspun, laid as a web on a moving bed, and then bonded together by heat and pressure. Tyvek® incorporates 25% post-consumer recycled content from plastic milk and water jugs.

Tyvek® envelopes are also recyclable: they are accepted for recycling under a nationwide recycling program established by DuPont, and subsequently recycled into wood alternatives. Small quantities can be mailed to DuPont for recycling, and for larger quantities, according to DuPont, there are recyclers in virtually every state (see, [http://www.tyvekenvelopes.com/vers\\_recycle.html](http://www.tyvekenvelopes.com/vers_recycle.html) or call 1-800-44-Tyvek®)

Kraft paper envelopes are commonly used for applications requiring high strength and stiffness and are usually the envelopes of choice when light weight is not a consideration. Brown kraft paper is typically used to make large envelopes for internal/external office communications, grocery bags, medical envelopes, and photo mailers. These grades of paper are produced with a higher percentage of long fibers for improved strength.

Natural unbleached kraft paper is brown, but the use of semi-bleached or fully bleached sulfate pulps produces lighter shades of brown, cream tints, and white. When you order paper envelopes, insist on “chlorine free” and, if color is not a concern, make sure you specify “unbleached.”

As with other paper-based products, post-consumer recycled content envelopes are a good choice, as are envelopes made with alternative fibers. Green Seal recommends that recycled content be at least 30% post-consumer.

## Floppy Disks and Compact Discs

- Less than 30% of all packaged software is recycled. That's well over 5.5 million boxes of software headed straight for our landfills and incinerators.

- End users throw away approximately 3 to 4 million failed or surplus diskettes every day, or well over 1 billion each year.
- In landfills, diskettes take over 450 years to decompose and will eventually leach oxides into groundwater.

### WHAT TO DO WITH FLOPPY DISKS AND CDS?

- *Don't landfill or burn them*
- *Reuse them before you recycle them*

**Floppy disks** can be reused hundreds of times. A "full" or "unconditional" formatting erases all old data and makes the disk fully usable again. Defective or otherwise unusable floppy disks can be sent to a recycler who will refurbish them or recycle the materials they contain. Recycled floppy disks are also available for purchase. These are typically reformatted from discarded unused software and have never been in a computer. Green Seal recommends their use.

Send diskettes for recycling to GreenDisk at:  
GreenDisk Services, 2200 Burlington, Columbia, MO 65202  
☎ 800-305-3475

**Compact discs (CDs)** can be reused for data storage only if they are re-writable. Scratched discs may be refinished in some cases. When purchasing CDs, there is no need for individual packaging in plastic jewel cases, as the disks are quite durable. Bulk spindles of CDs are available, and paper or thin plastic covers may be used for protection.

CDs contain polycarbonate and aluminum, which are recyclable materials. CDs can be down-cycled into such other products as CD holders and automotive parts. Some processors can actually remove the data layer and reuse the plastic disc (recordable CD-R's have about 20 mg of gold that can be recovered). If you are worried about proprietary data, you can cut them with a pair of heavy-duty tin shears before recycling.

Send CDs for refinishing to:  
AuralTech, 12802 Reiner Rd.,  
Monroe, WA 98272 ☎ 888-454-3223

Send CDs for recycling to:

1. GreenDisk Services, 2200 Burlington, Columbia, MO 65202 ☎ 800-305-3475
2. NESAR Systems, 420 Ashwood Road, Darlington, PA 16115 ☎ 724-827-8172
3. Digital Audio Disk Corporation, Attention: Disc Recycling Program, 1800 Fruitridge Ave., Terre Haute, IN 47804-1788 ☎ 812-462-8323
4. Plastic Recycling Incorporated, 2015 South Pennsylvania, Indianapolis, IN 46225 ☎ 317-780-6100



## Pens and Pencils

### *Make the "write" choice!*

Around 1.6 million single-use pens are thrown away in the United States each year, ending up as solid waste destined for landfills. An effort to purchase refillable pens and pencils as much as possible will greatly reduce this waste. Refillable pens made from recycled materials are also now available. Ink tubes can be made from recycled plastic, and the ballpoint can be made from recycled metal. The barrel can be made from all sorts of materials, such as unbleached recycled paper, recycled plastic or rubber, and biodegradable biopolymers, such as cornstarch or other starches.

Pencils are traditionally made of a graphite and clay core in a wood housing, although refillable pencils are available. Virgin wood is typically used and, unless it comes from a sustainably managed forest, it cannot be considered a "renewable" material. In fact, rainforest hardwoods have been commonly used to make pencils, though cedar is currently used more frequently in the United States. An average California incense cedar tree yields about 172,000 pencils and, given the annual U.S. production of 2 billion pencils, approximately 11,600 trees must be cut down each year in the United States to make pencils.

Pencils made of post-consumer recycled materials help save trees and provide a good end-use for various kinds of waste newspaper, cardboard, and plastic materials, diverting them from landfills. A variety of innovative materials are used to make recycled-content pencils, some of which include cafeteria lunch trays and



## USE REFILLABLE PENS AND PENCILS

**T**he benefits of using refillable pens and pencils are obvious. While the consumable part is only the pencil lead and the ink, the barrels themselves are quite durable. Though they cost about three or four times as much as single-use pens and pencils, they can be refilled and reused many times. The refills cost very little, so the higher initial cost is easily recovered over time, resulting in overall savings in the long run. Moreover, the greatest benefits of using refillable pens and pencils are realized in terms of natural resources and energy saved and considerable wastes and pollution avoided by not having to manufacture a complete pen or pencil to replace the exhausted one.

shredded (out of circulation or otherwise unusable) dollar bills.

## Presentation Transparencies

### *Closing the recycling loop!*

About 15 million pounds (6,800 metric tons) of polyester transparency film are discarded in the United States each year. Though polyester (or polyethylene terephthalate—PET) is a recyclable material (in most programs), the coatings on transparency films bind the ink and toner firmly to the surface, making the material extremely difficult to recycle. 3M, however, has developed a recycling process and has a program in place that accepts transparency film from any manufacturer, thereby diverting it from landfills. 3M's transparencies contain an average of 50% recycled content, 25% of it post-consumer. Most 3M transparencies are made with a water-based coating (99 percent solvent-free), resulting in a cleaner manufacturing process. For information on 3M's recycling program, call 800-328-1371 or (570) 654-5511.

## Toner Cartridges

### *Nine Lives!*

Laser printers produce images by transferring the dry toner powder from an electrically charged drum to the paper using heat. Laser-printer toner cartridges contain between two and three pounds of plastic and metal. These materials are completely usable after the toner runs out. Discarding toner

*Discarding toner cartridges simply because the toner powder contained in them has been used up is an unnecessary waste of natural resources.*

cartridges simply because the toner powder contained in them has been used up is an unnecessary waste of natural resources. Discarded products take up valuable landfill space

and pollute the environment. Industry estimates indicate that it takes about one pint of oil to produce a new cartridge. Remanufacturing toner cartridges to last just one more lifetime could save about 100,000 barrels

of oil each year. Moreover, remanufacturing makes perfect economic sense as well because a remanufactured cartridge can be obtained at roughly half the price of a new one.

In the 1980s, remanufacturing of laser toner cartridges consisted of drilling holes in the unit, pouring the toner in, and then sealing the holes. This "drill and fill" process was not reliable, and the product quality was inconsistent. The current remanufacturing process consists of completely disassembling the cartridge, properly disposing of the remaining toner, cleaning and inspecting all internal parts, refurbishing or replacing the drum as necessary, repairing or replacing all worn parts, refilling with fresh toner, reassembling, and testing.

With thousands of toner-cartridge remanufacturers in the United States today, and laser-printer cartridge remanufacturing forming the largest segment of this industry, it is important to keep the following questions in mind when you select a vendor:

- Are the unusable (worn) parts removed from spent cartridges recycled?
- Do the replacement components incorporate recycled content?
- Does the vendor accept spent cartridges and provide a credit?
- Does the vendor test 100% of the units?
- Does it claim that the remanufactured cartridge will perform as well as or better than the OEM cartridge?
- How good is the vendor's warranty?

# Checklist

## RECOMMENDED PURCHASE CRITERIA

The purchase criteria recommended by Green Seal for each product category are provided below. EPA's Comprehensive Procurement Guidelines (CPG) for purchasing recycled-content products have been taken into consideration in developing the recommended criteria for recycled content of various items.

### Binders

- Plastic covered paperboard: plastic (typically vinyl) at least 25% total recycled content; paperboard at least 90% total recycled content, with 75% post-consumer
- Paper-covered paperboard: 90% total recycled content with at least 75% post-consumer
- Cardboard: 100% post-consumer content
- Solid plastic: HDPE, at least 90% post-consumer content; PET, 100% post-consumer content; other plastics, at least 80% post-consumer content

### Clipboards

- 100% total recycled content with at least 50% post-consumer

### Correction Fluid

- Water-based, non-toxic, ozone-safe

### Envelopes

- Kraft Paper: 50% total recycled content with at least 30% post-consumer
- Paper: 50% total recycled content with at least 30% post-consumer
- Alternative Fiber: 50% "tree-free" content, with the balance post-consumer recycled content
- Plastic: 25% total recycled content, all post-consumer

### Highlighters & Markers

- Water-based, certified AP non-toxic, conforming to ASTM D-4236
- When purchasing dry-erase or permanent markers, choose "low odor"
- Or choose refillable, if available

### File folders

- 100% total recycled content with at least 30% post-consumer

### Labels

- 50% total recycled content with at least 30% post-consumer

### Pens and Pencils

- Choose refillable as the first choice, preferably with the construction materials containing recycled or biopolymer content
- Single-use: buy 100% total recycled content with at least 50% post-consumer, or choose biopolymer for pen barrels that is also biodegradable

### Presentation transparencies

- 50% total recycled content with at least 25% post-consumer

### Self-stick notes

- 100% total recycled content with at least 30% post-consumer

### Toner cartridges

- All cartridges tested by remanufacturer, parts removed from spent cartridges recycled, recycled content in replacement parts

### Additionally, for all paper products:

- At a minimum paper bleached without elemental chlorine, but preferably paper that is free of both elemental chlorine and chlorine derivatives or unbleached





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## **IN THIS ISSUE**

---

- *Markers & correction fluid*
- *Paper products*
- *Floppies & CDs*
- *Pens & pencils*
- *Transparencies*
- *Toner cartridges*