



Environment

I N F O R M A T I O N F R O M K O D A K

J-412 \$10.00

Waste Prevention and Recycling for Photographic Processing Facilities



Kodak is committed to providing owners and operators of photographic processing facilities with easy-to-use recycling programs and timely information on waste management and recovery options. Beyond the environmental benefits, increasing waste minimization, reuse, and recycling can improve workplace efficiency and your bottom line.

This publication identifies programs and ideas on how to prevent unnecessary waste and how to reuse products handled every day and then recycle them. While many Kodak products used at a photographic processing

facility can be recovered through community-based or commercial recycling programs, some cannot. To help you manage these materials and recycle as much as you can, Kodak has established several recycling and "take-back" programs.

- Included in this publication:
- Minimizing the amount of waste your business generates.
 - Reusing products and effluents.
 - Recycling through Kodak programs or community-based programs.
 - Determining appropriate disposal for non-recyclable materials.

Kodak has established several recycling and take-back programs. Customers should explore these and other programs offered in their community to address their waste management needs.



This publication addresses primarily non-hazardous wastes. For hazardous wastes generated at a photographic processing facility, refer to KODAK Publication No. J-411, *Dealing with Hazardous Waste and Processing Effluents at Photographic Processing Facilities*, which details regulations for their recovery and disposal. To address the proper management of nitrocellulose motion picture film, see KODAK Publication No. H-182, *Safe Handling, Storage, and Destruction of Nitrate-Based Motion Picture Films*. See KODAK Publication No. J-208, *Introducing the 'Silver Management' Series*, for information on silver recovery and applicable rules.

ON-LINE INFORMATION

For waste management and recycling information 24 hours a day, visit Kodak's web site at www.kodak.com/go/kes. You will find information on all Kodak recycling programs, waste management resources, and technical guidance. For more information, call Kodak Environmental Services at 1-716-477-3194 (8:00 a.m. – 5:00 p.m. Eastern time).

To assist film producers with post-production, preservation, and environmental disposal of film, FPC, Inc., a Kodak company, was founded in 1952. Since 1988, when Kodak acquired FPC, this company has diverted over 100 million pounds of motion picture film from landfills. In addition to motion picture film destruction and recovery, FPC offers a variety of motion picture products and services. To find out more, visit FPC's web site at www.fpcfilm.com or call 1-323-468-5774.

AVOID GENERATING MORE WASTE THAN WATER

Facility Waste Management Assessment Tool

Category	Type of Solid Waste	Quantity Generated at Your Facility (Example: pounds per month)	Disposal Costs Before Waste Reduction Efforts	Disposal Costs After Waste Reduction Efforts	Type of Waste Reduction Effort Used (Reduce, reuse or recycled)	KODAK Recycling Program Available ✓	Other KODAK Publications Available (in addition to this series)
BATTERIES	Alkaline-Manganese						
	Small Sealed Lead-acid						
	Mercuric oxide						
	Nickel-Cadmium					✓	
	Nickel Metal Hydride						
	Silver oxide						
	Lithium						
CHEMICALS	Discontinued						
	Unused (virgin)						
	Expired						
	Processed (contaminated/used)						
EFFLUENTS	Silver bearing					✓	CIS-57, CIS-147, CIS-164, J-212, J-215
	Non-silver bearing					✓	CIS-57, CIS-147
EQUIPMENT	Processors, monitors, scanners						
	Miscellaneous electronics						

The first thing you can do to reduce waste—and save money—is not create it in the first place. To find out where your business could improve its waste reduction efforts, review the Facility Solid Waste Assessment Tool (KODAK Publication No. J-410, *An Introduction to Waste Management Options for Photographic Processing Facilities*). Use this guide as you walk through your workplace and identify waste minimization and recycling opportunities.

Waste assessment is one of the best ways to understand:

- the types of waste your business generates,
- the quantity of wastes generated over a given period of time, and
- the source, or area within the facility, where specific wastes are generated.

With a clearer picture of the quantities and constituents in your waste stream, you can consider improvements in source reduction and waste recovery. In addition to environmental benefits, these changes are likely to improve operational efficiency and result in cost savings.

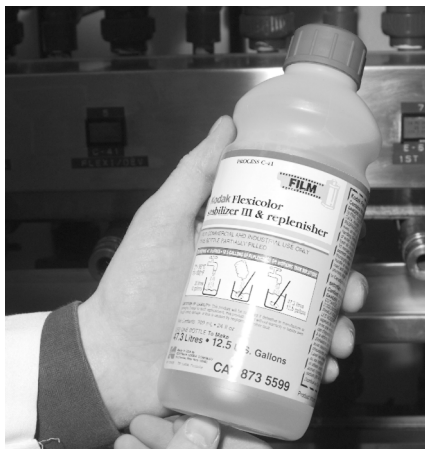
The Facility Solid Waste Assessment Tool also provides a quick reference to Kodak recycling programs and publications tailored to particular wastes. In addition, it contains a column to record actual costs spent on disposal, which allows for tracking any savings your business may reap after implementing a waste reduction or recovery program.

Consider the following activities, and rethink ways to step up efforts at your facility to reduce waste.

INVENTORY CONTROL

A big area for waste minimization and savings is inventory control. When managing your photographic processing inventory:

- *Rotate stock so that the oldest is used first. "First in, first out" avoids products—for example, photo processing solutions—reaching their expiration date before being used because they were buried in the back of the storage closet.*



- *Maintain an appropriate supply. If your facility continues to run out of X, but has an oversupply of Y which has to be thrown out because it's past the best-use date, reconsider how photographic processing inventories are stocked.*
- *Make inventories accessible so that it's easy to "see what you've got."*

TRAINING PERSONNEL



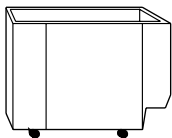
Be sure that employees are trained to mix processing solutions correctly. Improperly mixed chemicals can lead to unnecessary discards. If someone mixes chemicals outside your facility, such as a distributor or solution service dealer, make sure you understand

their quality assurance and quality control guarantees and policies. It may also be useful to ensure that your supplier has adequate and environmentally responsible disposal plans in place should they have to discard chemicals that have been mixed incorrectly.

PREVENTIVE MAINTENANCE

OPERATING MANUAL

XYZ Processor



XYZ Company Logo

Another simple way to reduce waste generation—and have a big impact—is to adequately maintain equipment. When an on-going, preventive maintenance program is in place, equipment will operate at optimum levels.

For example, roller/squeegee maintenance limits the amount of chemical crossover. Replenisher pumps that are free of corrosion and chemical build-up ensure proper replenishment rates, also limiting the amount of overflow. And silver-recovery equipment that gets the same kind of preventive maintenance as processing equipment maximizes benefits from the system.

Consider instituting a maintenance schedule for each piece of equipment. Personnel should always follow the equipment manufacturers' operating manual to determine the proper intervals of care. The economic savings and reduction in waste will more than compensate for "down time" and labor spent on upkeep of equipment.

USE AND MAINTENANCE OF SQUEEGEES

Squeegees, which remove residual surface liquids from film or paper as they travel from one processor tank to the next, are an inexpensive and effective pollution prevention option that also improves silver recovery. A squeegee reduces carryover, keeping the silver in the fixer or bleach-fix tank where the overflow can be sent to silver recovery instead of being lost in the wash tanks.

To avoid unnecessary solution crossover and contamination, train personnel to follow guidelines carefully for proper installation, maintenance, and use of squeegees. Squeegees should be routinely checked and replaced as required. Also, consider including the cleaning and maintenance of squeegees as part of regular shutdown procedures.

MONITORING CHEMICAL AND WASH WATER FLUCTUATIONS

- *Replenishment Rates*—
Replenishment rates have decreased dramatically in the past 10 years. Using chemicals with a low replenishment rate results in less overflow for silver recovery and discharge. Be sure, however, to follow manufacturer recommendations for chemical replenishment rates. Monitor these rates at regular intervals for accuracy.



Monitor replenishment rates at regular intervals for accuracy.

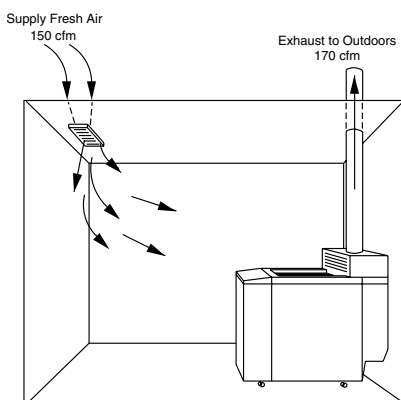
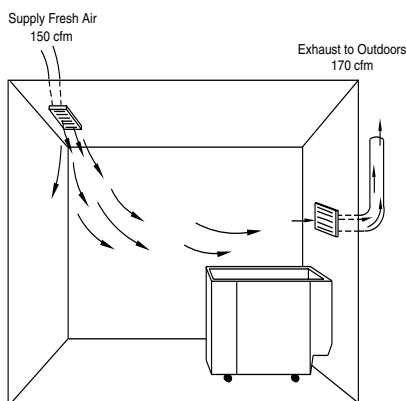
- **Wash Water**—Review all opportunities to cut back on wash water during non-processing and non-production periods. This may include the use of timers that automatically shut off water during non-production periods. It may also include the use of a water saver valve. Finally, evaluate the water flow rate for consistency.
- **Evaporation**—If processing tanks are designed to be covered, make sure that this practice is followed. This ensures that evaporation is kept to a minimum. It also prevents cross-contamination of chemical solutions.



PROPER VENTILATION

Practice adequate ventilation in your photographic processing area as required by equipment manufacturers' operation manuals. This will prevent buildup of condensation that could lead to processing chemical cross-contamination problems. The result

of this is unnecessary waste and expense when tainted chemicals have to be discarded. This is another area where a simple policy can have a big impact on waste reduction and business expenses. For more information, refer to KODAK Publication No. J-314, *Indoor Air Quality and Ventilation in Photographic Processing Facilities*.



LOW REPLENISHMENT CHEMICALS

Consider using low replenishment options for your developer, bleach, and fix. Low replenishment chemicals require fewer mixes and reduce the overall effluent discharge. The amount of chemicals needed is also reduced, which saves costs. Kodak offers low replenishment options for FLEXICOLOR and EKTACOLOR Processes. Other manufacturers may offer alternatives as well.

See KODAK Publication No. Z-100, *Using KODAK Chemicals in Minilabs*, or contact your Kodak representative or Kodak distributor for more information on replenishment rate reduction opportunities for your photographic processing operation.

REUSING PRODUCTS

The second approach to waste prevention is to reuse products and liquids until their usefulness has expired. This may include reusing products or packaging for a use other than that for which they were intended. The only items you should not consider reusing are chemical containers. Below are a few ideas for reusing items in your facility. You may already have discovered unique ways to reuse items handled every day.

CHEMICALS AND WASH WATER

Used processing chemicals and wash water make up perhaps the largest component of a photographic processing facility's waste stream. As appropriate, it may be beneficial to install specialized equipment or implement recovery procedures to help conserve and reuse these effluents.

- *Special Equipment for Reuse*—Some manufacturers offer equipment that allows for the reuse of developer, fixer, bleach, or even the wash water. Typically these systems serve larger size facilities. They remove a certain percentage of the used chemical and then combine it with fresh chemicals as necessary before it is reintroduced back to the processing tanks.

In some photographic processing businesses, such as medical imaging centers, the use of such equipment must be carefully reviewed. Since these businesses are regulated by the Federal Drug Administration, image quality must not be compromised. In some situations, reducing replenishment rates may achieve similar chemical cost savings and effluent reduction. In any case, strict quality assurance measures must be in place.

- *Reuse of Process Chemicals*—Many suppliers now offer regenerating products for reuse of developer, fixer, and bleach. Kodak offers these for FLEXICOLOR and EKTACOLOR Processes. Use of regenerating products minimizes the volume of solution waste and allows for reuse of the original replenisher. For more information, refer to KODAK Publications No. Z-130, *Using KODAK EKTACOLOR RA Chemicals*; No. Z-131, *Using KODAK FLEXICOLOR Chemicals*; and No. Z-100, *Using KODAK Chemicals in Minilabs*. You may also call Kodak Information Center at 1-800-242-2424.
- *Low-Flow Wash*—In order to minimize processing chemicals that may move into the wash water, consider the use of a low-flow wash after the bleach-fix. With a low-flow wash, you can recover silver that would otherwise be carried into the wash where it is more difficult to recover. Using a low-flow wash keeps the silver concentrated so that it can be more efficiently recovered.

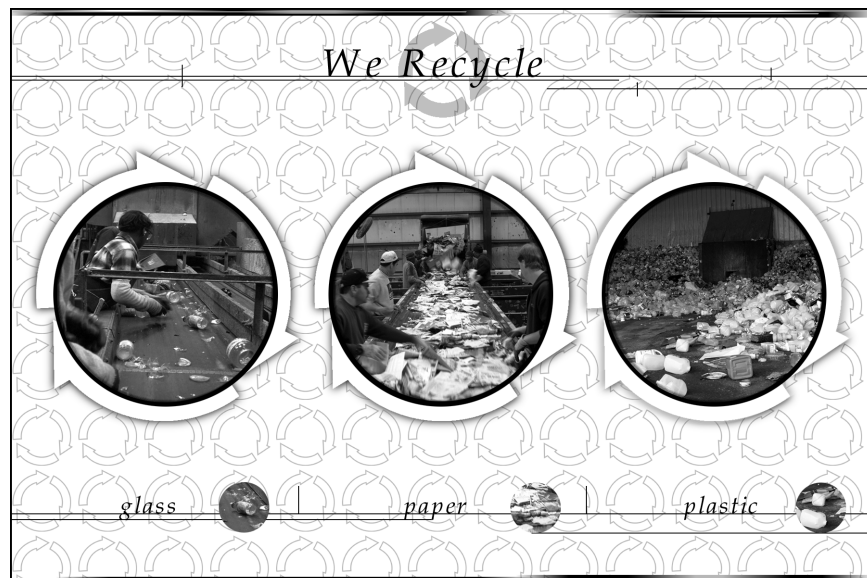
ALKALINE BATTERIES

Alkaline batteries from one-time-use cameras in most cases have enough energy left to power other electronic devices and may be reused in certain applications. Some of these batteries will have undergone more of an energy drain than others. If your business has no outlet for these batteries, consider donating them to a non-profit group, local charity, or a disaster relief organization such as the Red Cross. You may even want to offer them to employees. See "Batteries" on page 16 for information about recycling and disposal of alkaline batteries.

FILM STORAGE AND PLASTIC FLIP-TOP STORAGE CONTAINERS

Film storage and video news film containers—both metal and plastic—are easily reused after their contents have been recycled. Made of rigid materials, these containers are highly protective and convenient for storage. They are ideal for reuse. You may want to use them for something other than the storage of film.

RECYCLING



A final option is to recycle—take what is otherwise thrown away and recover it for manufacture into a new product. Many films, steel, plastic, and paper can all be recovered, processed, and returned to life as new products. For example, recycled cardboard boxes are made into new boxes as well as other paper products. And, silver and plastic can be extracted off polyester film support for use in new photographic products.

Many Kodak products and packaging used at a photographic processing facility can be recovered through local community recycling programs. This includes most paper, metals, and some glass and plastics. Kodak has established several customer friendly recycling and “take-back” programs for Kodak products that are probably not included in your local recycling program.

When recycling, consider how you will sort, compact, and store recycled materials before they leave

your business—especially if you are short on space. Designate a specific area for collection of recyclables. If appropriate, you may want to store recycling containers close to where waste is generated to make sorting and collection more convenient for employees. Be sure to clearly label all containers. As appropriate, provide written instructions either on the container or a nearby wall on how to prepare materials for recycling.

Consider how much is generated and the frequency of pickup for each recycled material. These will affect the size of the collection container needed. If your end market allows, some recyclables could be mixed together, which will also impact the size of the collection container. And, consider compacting recyclables to help save space. For example, unused corrugated boxes—as well as paperboard boxes—can be flattened, significantly freeing up storage space.

DISPOSING OF NON-RECYCLABLE MATERIALS

Now, find the products and packaging below that you typically throw out—especially in large quantities—and consider taking advantage of opportunities to recycle them.

PHOTOGRAPHIC FILMS

Film typically comes in two forms—sheet or roll—and is made from cellulose triacetate, PET (polyester), or PEN (plastic). Photographic film waste is usually a developed negative that displays an image of poor quality. Discarded film may be a test strip or leader. Film may also be thrown out as a result of process problems, over- or under-development, or poor inventory management.

The recyclability of different types of Kodak film depends on factors such as the film type, the marketplace for recycled material, the proximity of facilities that can recycle Kodak films, and the quantity of film available for recycling. Many types of film are recycled because of the resident silver and plastic support value. Polyester and unprocessed acetate films are the most recyclable, and Kodak has take-back programs for these.

When a film cannot be recycled, waste-to-energy opportunities may be explored prior to landfilling, especially if the amount of film waste is large. The plastic supports in Kodak films have high calorific value when incinerated, making them a good source of energy. It is also important to consider that silver will remain with the ash after the incineration process. This silver-rich material may be a candidate for further silver reclamation activities. Check with your local recycling coordinator or the Yellow Pages for a nearby waste-to-energy facility.

PET / Silver Halide Films



Kodak accepts most polyester films for silver refining and film-base recovery through its Film Recycling Program.

Polyester film, or PET, is typically used for medical and industrial x-ray and aerial films, overhead transparencies, silver-halide graphic-arts film, and long-roll professional imaging products. Generally, if the film is a sheet film, there is a high probability that it is manufactured using PET as the base material. These films are also distinguished by the fact that they cannot be torn by the human hand.

Kodak accepts most polyester films for silver refining and film-base recovery through its Film Recycling Program. Polyester film can be recycled once its coatings are removed. The recycled silver and polyester bases are used by Kodak to manufacture new film—which typically contains 40 - 60 percent recycled material.

To recycle polyester-based film, simply return the film to Kodak. Films must be:

- clean, dry, and segregated from other film types,
- free of all reels, cores, spools and sleeves (do not include in shipment), and
- free of spliced film or film with tape or staples attached.

Specifications for polyester film recycling require that you have at least 1,000 pounds of film before shipping to Kodak. The film should be returned in a large, strong cardboard box (4 x 4 x 5 feet and sometimes called a "Gaylord" box) and shipped on a standard wooden pallet.

All the film contained in the box or drum must be polyester film. Acetate or thermal films should be shipped separately for recycling. Kodak, however, will accept any manufacturer's polyester film base for recycling. If you cannot store film to accumulate the minimum quantity, visit Kodak's web site (www.kodak.com/go/kes) for a list of scrap film buyers who may accept smaller quantities, or call Kodak Environmental Services at 1-716-477-3194.

When your shipment is ready, contact Kodak at 1-888-685-0537 for information on how and where to send it. In return, you receive payment for the actual silver and polyester content of the film purchased, less processing costs, based on current market rates.

Cellulose Triacetate Films

Film negatives used for motion pictures are composed of triacetate. Acetate-based films are identifiable because they can be easily torn. Most consumer and professional films are acetate-based and can be recycled.

FPC, Inc., a Kodak company, is equipped to handle motion picture customer needs for certified destruction and recycling of this film. After the copyrighted images and sound have been destroyed, the salvaged acetate base is recycled. Since 1988, FPC has diverted over 100 million pounds of motion picture film from landfills.

FPC provides these services from three locations: Hollywood, CA (headquarters), Mountain City, TN, and Milan, Italy. For instructions on returning motion picture film for destruction and recycling, call FPC at 1-323-468-5774 or visit their web site at www.fpcfilm.com.

PET / Thermal Imaging Films

Thermal imaging films typically include recording film, duplicating film, and thermal ribbon. To date, a recycling process and infrastructure have not been developed for thermal imaging films. These films do not respond to the traditional emulsion stripping processes used on PET / silver halide films because they are solvent coated rather than aqueous systems.

Work, however, is ongoing at Kodak to look at whether these films could be used as a feedstock to make new recycled plastic products. In the meantime, these films can be incinerated for energy recovery or disposed of in a municipal landfill.

PEN Films

PEN is a “new” plastic material that is used in certain films. Because this is an immature market, there are no established mechanisms for recycling PEN plastic. However, there are already companies investigating recycling options for this material since PEN is a highly valuable commodity. Such methods could include breaking the plastic down or mechanically cleaning contaminants off of the PEN. Until then, these films can be incinerated for energy recovery or disposed of in a municipal landfill.

Nitrate-Based Films

Unless your business is involved with the motion picture industry—and archives film—it is unlikely you will need to dispose of cellulose nitrate-based film. After 1951, Kodak stopped manufacturing this type of film, replacing it with triacetate.

Large quantities of cellulose nitrate film for archival or other purposes still exist in storage. Nitrate film will typically decompose into unstable products. Take special precautions when handling, storing, and moving this material. The film should be disposed of as a hazardous waste.

For more information on handling and disposal procedures, see KODAK Publications No. H-182, *Safe Handling, Storage, and Destruction of Nitrate-Based Motion Picture Films*, and No. J-411, *Waste Management at Photographic Processing Facilities—Dealing with Hazardous Waste and Processing Effluents*.

METALS

Silver

Kodak accepts silver-bearing materials for refining, recovery, and recycling either directly or through third parties. In addition, we recover silver from processed and unprocessed film (See “Photographic Films” on page 7.) Silver recovered directly by Kodak is used to make new Kodak photographic products.

Below are silver-containing materials that you may be able to return to Kodak for recovery and payment for the value of the silver. For more information on a plan for silver management and recovery, see KODAK Publication No. J-208, *Introducing the ‘Silver Management’ Series*.

Silver Flake From Electrolytic Recovery Units

Kodak can accept metallic silver flake, produced from electrolytic recovery units, for refining and recovery. A minimum of 19 pounds (277 troy ounces) is generally required for shipment and reimbursement. If you are unable to store the flake silver until you have acquired this amount, check the telephone directory for precious metal refiners or buyers in your area, or visit Kodak’s web site at www.kodak.com/go/kes for a list.

Silver flake should be shipped to Kodak in a five-gallon (or larger) polyethylene pail. If you have some other container, verify with Kodak that it is appropriate. You may also want to consider insuring the shipment since the contents are valuable.

Metallic Replacement Cartridges (MRCs) or Chemical Recovery Cartridges (CRCs)

MRCs or CRCs contain a silver-rich sludge, which is a combination of degraded metallic iron and collected silver. A properly designed and maintained single-cartridge MRC / CRC system is capable of recovering more than 95% of the silver when used in accordance with manufacturer-specified flow rates. When fully exhausted, a MRC / CRC should contain 20 - 40 percent silver by dry weight.

Although Kodak does not generally accept MRCs and CRCs for refining, we will accept them if they are accompanied by a shipment of film, silver flake, or silver-rich precipitates such as TMT in acceptable quantities. This is because Kodak does not refine these cartridges on site. They are sent to a third party for refining.

We recommend that you work with a refiner directly for silver recovery from MRCs and CRCs. If you cannot find a reputable refiner in your local telephone directory, visit Kodak's web site at www.kodak.com/go/kes, or call Kodak Environmental Services at 1-716-477-3194.

Ion Exchange Resins

Kodak does not accept ion exchange resins, which result from removing silver from wash water, for refining. You can find a list of refiners, however, on Kodak's web site at www.kodak.com/go/kes.

Other Silver-Rich Materials

Precipitates and other silver-rich sludges are handled on a case-by-case basis. To determine whether we will accept your material, you will need to provide a representative sample of the material for analysis and acceptance. Kodak will then provide a price quote. Call Kodak at 1-888-685-0537.

Lead Foil/Intraoral Dental Packets



In general, lead foils are considered a hazardous waste and their management is discussed in KODAK Publication No. J-411, *Dealing with Hazardous Waste and Processing Effluents at Photographic Processing Facilities*. If, however, you are a dental office or conditionally exempt small quantity generator (CESQG) and use intraoral dental packets, Kodak has an easy and economical recycling program for the lead foil waste your business generates.

Any business that participates in the KODAK Dental Film Lead Recycling Program is provided with a lead recycling container. Keep the container in a clean, dry, and accessible area of the darkroom. When using dental film, separate the lead foil from all other contents of the film packet and then place it in the recycling container.



When the container is full, call UPS for a pickup. It takes the average dental office about one year to fill the lead recycling container, which should weigh from 7 to 10 pounds when full. In exchange, you will receive a letter confirming proper treatment of this waste. To order this service, call the Kodak Dental Line 1-800-933-8031.

Medical X-ray Cassettes

Lead from medical x-ray cassettes is a hazardous waste unless the lead is going to be recycled. Refer to KODAK Publication No. J-411, *Dealing with Hazardous Waste and Processing Effluents at Photographic Processing Facilities*, for instructions on how to manage and properly dispose of this material.

Outside Steel Casings from 35 mm Film Magazines



The recovery of 35 mm film casings, made from steel and plastic, is handled through the KODAK Film Container Recycling Program (see KODAK Publications No. CIS-180 and CIS-182, *KODAK Film Container Recycling Program*). This program manages the recovery of the entire 35 mm waste stream (metal and plastic). For more information, also see 35 mm Film Processing Packaging—Canisters, Lids, Spools, and Cartridges on page 12 in this publication.

While you may elect to find a recycling option in your community—steel is a highly recycled material—the Kodak program offers a lot of convenience. To find a recycling program in your community, contact your local recycling coordinator, or contact the Steel Recycling Institute at 1-800-YES1CAN (1-800-937-1226) for a list of processors in your area.

Film Containers (Motion Picture Films)

Motion picture film containers are made of a tin-free steel. In most cases film is stored in this container for the life of the film. If you are sending film back to FPC, Inc. for destruction and recovery (see information on triacetate and PET motion picture film recovery), they will also accept the metal container for recycling. If you choose to recycle them locally, contact a scrap dealer in your area.

PLASTICS

Chemical Drums (15, 30 and 55 gallon)

Chemical drums used in the photofinishing process are made out of a high-density polyethylene (HDPE) plastic and are both reusable and recyclable. The KODAK Returnable Drum Program offers a simple and convenient way to recycle all three drum sizes—and return them for reuse. This is an easy, low-cost way for photographic processing facilities to decrease waste disposal costs.

To recycle drums that have contained both hazardous and non-hazardous liquids:

1. Empty completely (no rinsing necessary) and make sure the outside is free of chemicals.
2. Replace closures and leave all labels intact.
3. Mark all drums with the appropriate hazardous shipping label and comply with the definition of empty as defined by the U.S. Environmental Protection Agency.
4. Prepare a bill of lading, including completion of an empty-drum certificate.
5. Contact Kodak's preferred carrier in your area to arrange for shipping 24 hours before you want a pickup.

You may accumulate as many drums as possible without holding them longer than a month before shipping. A minimum of five drums and a maximum of 50 drums per shipment is required. Drums must be shipped in compliance with U.S. Department of Transportation requirements and all city, state, and federal regulations. For details about participating in this program, see KODAK Publication No. CIS-139, *KODAK Returnable Drum Program* (downloadable from Kodak's web site), or call the Kodak Information Center at 1-800-242-2424.

Photochemical Containers



Most of the small plastic Kodak photochemical containers are manufactured from high-density polyethylene (HDPE), or the Society of Plastics Industry (SPI) code number 2, and low-density polyethylene (LDPE), code number 4. Some Kodak plastic containers are made from layered multi-material plastics and these are coded number 7. The SPI code, which identifies plastic by its type of resin, is located on the bottom of the container and is used to separate different kinds of plastics for recycling.

For plastic photochemical containers, Kodak suggests that your business participate in a community recycling program, which is best equipped to collect these for recovery. Kodak does not accept back empty plastic or glass photochemical containers. To find out what types of plastics can be collected for recycling in your area, contact the local or state recycling coordinator, the collection contractor, or a local plastic recycling company. If they cannot assist you, call the American Plastics Council at 1-800-243-5790 for a list of plastic recyclers in your area.

Before placing containers in the recycling collection receptacle, be sure to:

1. Empty them of all residual product.
2. Slowly rinse caps and empty containers with cold water. Repeat two times—using warm water (approximately 100 °F [37.78 °C]) for the final rinse to increase the solubility of any remaining chemicals.
3. Discard caps and any containers that have visible stains or residue after triple rinsing.
4. Slit plastic containers so they cannot be used again.
5. Make sure that all residual product and rinse water is disposed of in accordance with local, state, and federal regulations.

35 mm Film Processing Packaging—Canisters, Lids, Spools, and Cartridges

To help photofinishers recycle the plastic and metal waste from 35 mm film processing, Kodak offers the Film Container Recycling Program. Since 1992, this award-winning recycling program has diverted over 53 million pounds from landfills. This includes recovery of:

- 135 film containers (HDPE) and lids (LDPE);
- 135 steel magazines, end caps, and plastic spools (polystyrene);
- 120/220 spools;
- 110, 126, disc, and super 8 film plastic cartridges;
- Photo CD jewel cases (these protective cases are made from polystyrene); and
- Core plugs from the ends of the photographic paper rolls (polystyrene).

Plastic from spools is made into products like sheet lifters. Steel from film cartridges is sent to steel mills to be made into wire. After cleaning, the film cans and lids are ground up and re-extruded. The plastic pellets are then sold back to Kodak to be

used all over again in the manufacture of film container bottoms. For information on participating in the program and sorting and shipping requirements, contact the Kodak Information Center at 1-800-242-2424.

One-Time-Use Cameras



Since 1990, 250 million KODAK One-Time-Use Cameras have been recycled in over 20 countries through the KODAK One-Time-Use Camera Recycling Program. This is probably one of the easiest—and most cost efficient—recovery programs for a photographic processing facility. No separation of parts or materials is required. And, your business receives a rebate for any one-time-use camera (Kodak, Fuji, Konica—any brand or model) returned for recycling. Cameras are accepted with or without the battery.

Place used cameras in the recycling collection bin provided by Kodak. When the bin is full, it folds closed and is ready for shipping back to Kodak. By weight, 77 - 86 percent of KODAK One-Time-Use Cameras now may be recycled or reused—diverting over 40-million pounds from the waste stream. Shipping is free—prepaid and pre-addressed shipping labels are included with the collection bin. Pickup and delivery is also free of charge. For more information or to register for this program, contact Kodak at 1-800-847-8755.

Molded Foam Padding

The foam padding inside yellow boxes of Kodak roll film is made from expanded polystyrene foam packaging (EPS). Other familiar EPS products are “peanuts” used for packing. A nationwide recycling program set up through the Association of Foam Packaging Recyclers allows this material to be collected for recycling at drop off sites across the U.S. When preparing EPS for recycling, make sure it is clean and free of any plastic film, loose parts, or glued-on cardboard.

To find the most convenient EPS foam packaging collection center in your area, contact the Alliance of Foam Packaging Recyclers at 1-800-944-8448. They can provide you with a listing of current drop-off sites. If there is no EPS recycling available in your community, you may send your recovered EPS via U.S. Postal Service or UPS to an EPS recycling company. This listing is also available through the Alliance.



Photo CDs

Photo CDs are made from polycarbonate. Some plastic processors will accept polycarbonate plastics for recycling. Check either Recycler's World on the web (www.recycle.net) or your local telephone directory for plastic recyclers in your area that will accept polycarbonate.

Donor Rolls and Inkjet Cartridges



These are both made from polystyrene, SPI code number 6. The donor—or receiving—rolls are used in thermal printers and approval systems. If source separated, clean, and in sufficient quantities, this non-foam polystyrene, or high-impact polystyrene, may be recycled. It is best, however, to check with your local recycling coordinator or collection provider to find out about nearby recycling programs that may have a market for this material. You may also want to contact the Alliance of Foam Packaging Recyclers at 1-800-944-8448.

Thermal Ribbon

While thermal ribbon contains PET, the dyes in it make it unrecyclable. It is not hazardous, however, and can go to a municipal landfill for disposal.

Shrink and Stretch Wrap

Shrink wrap is made from polyolefin or PVC. The stretch wrap is made from polyethylene. While there are dealers that process these types of plastic, it would be difficult to generate a large enough quantity to cost effectively recycle them. These non-hazardous wastes can be sent to a waste-to-energy facility or municipal landfill for disposal.

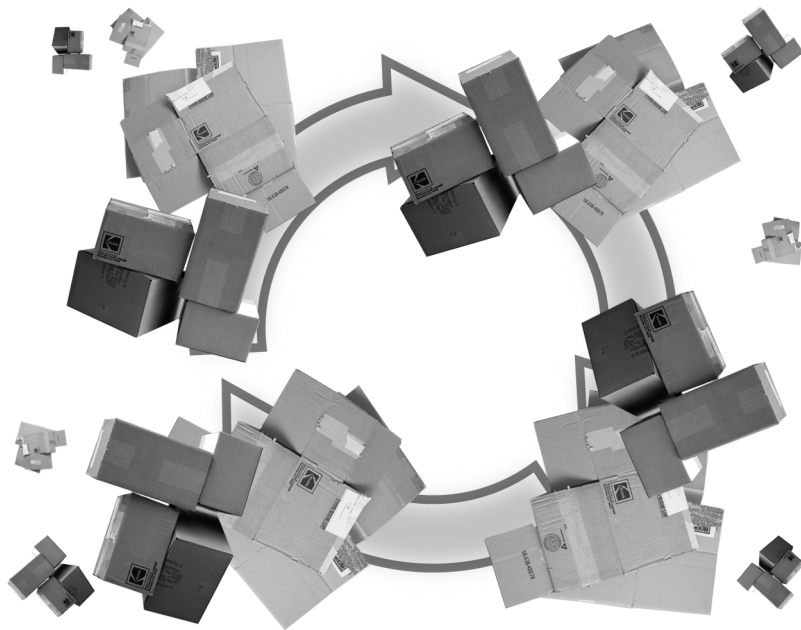
Leader and Leader Cards

These can be made from polypropylene, polyethylene, or PET (polyethylene terephthalate). If handled carefully, they can be reused. Check your local recycling program or collection company to determine if these are recyclable with other plastics.

Processor Filters

Filters, which remove particulate from processing solutions, are constructed of many different types of plastics and cloth material. Filters used for silver-bearing solutions, such as fixers or bleach-fixes, should be rinsed prior to disposal or sent to a hazardous waste treatment facility. Collect and treat the rinse water in your silver-recovery system.

PAPER



Corrugated Boxes

Old corrugated boxes are the most recycled packaging in the world, with well over 70 percent recycled, and most are made into new corrugated boxes.

Corrugated boxes are also easy to identify and separate. Be careful, however, not to include wax-coated boxes in with uncoated boxes for recycling. The wax coating inhibits repulping and is considered a contaminant. Starting in 1998, waxed boxes are being marked with the word “wax” in Spanish, French, and English to help distinguish them from uncoated corrugate.

If your business generates a large enough quantity, consider a baler on site to consolidate boxes. Bales are then transferred to a semi-trailer for delivery to a processor or directly to

a paper mill. Smaller businesses can collect corrugated boxes loose in containers designated for corrugated boxes only. After separating boxes for recycling, flatten them and make sure they are emptied of the following contaminants:

- packing materials, such as foam
- wood-reinforced corners,
- tapes, and
- large staples.

Contact the recycling coordinator in your area or talk with your collection contractor about separating old corrugated cardboard for recycling. Although markets for corrugated boxes fluctuate, like any commodity, the fiber is valuable.

Paper Cores



Launched in 1992, the KODAK Roll Paper Fiber Core Recycling Program—a partnership with Sonoco Products Company—offers a simple, convenient, and cost effective way to recycle roll paper fiber cores from the photofinishing process.

Photofinishers:

- separate and collect used cores,
- pack them in a corrugated box, and
- ship them to the nearest Sonoco recycling facility.

There is no minimum shipment size, but they cannot be shipped in plastic or metal containers. The shipment should also only contain paper cores. Refer to KODAK Publication No. PF3-561, *Roll Paper Fiber Core Recycling Program*, for a list of core recovery locations, or contact the Kodak Information Center at 1-800-242-2424. Shipping costs are at the photofinisher's expense, and must be pre-paid. To arrange for a full truckload shipment, call Sonoco directly at 1-800-223-1043.

Paperboard Packaging

Paperboard packaging encompasses a wide variety of products, including the folding cartons that contain photographic film. More than half of all paperboard packaging is made from 100% recycled paperboard. Some markets accept paperboard packaging separate from other recycled paper, while others accept it mixed with other grades of paper. This is usually referred to as a “mixed paper” program.

Check with the recycling coordinator in your area or your current collection contractor about whether there is a market for paperboard. Don’t start a paperboard recycling program at your business until you have identified a market. Not all mills can accept paperboard for recovery.

Photographic Paper

A photographic processing facility that is operating at optimum efficiency should have very little used photographic paper in the waste stream. It is best to minimize generation of this type of waste through good process controls. If for some reason you have unused photographic paper to dispose of, consider donating it first.

Photographic paper is coated with a PET resin, which makes it difficult to recycle. There are a few paper mills that accept PET coated papers—specifically milk cartons—for recycling. If you have a sufficient amount, contact your local recycling coordinator and ask about opportunities to recycle this material in your area. Otherwise, photographic paper should be disposed of at a waste-to-energy facility or in a municipal landfill.

Thermal and Ink Jet Papers

Thermal and ink jet papers are difficult to recycle because they have been chemically treated. It may be possible that a paper mill would accept these types of papers for recycling, but you would have to work directly with the end market, or paper mill, to determine that.

Check with your local recycling coordinator or collection contractor regarding local paper markets. All paper mills are a little different in the technology they use and the product they produce. This affects the types of recycled paper a mill can accept. If recycling is not an option, thermal and ink jet papers can be disposed of in a municipal landfill.

GLASS

Clear and Colored Glass

Photographic glass chemical bottles are recyclable; however, they need to be triple rinsed before being recycled. Also, remove any metal caps or lids (labels are okay). Glass is best recycled through your local recycling program. You can also check the Yellow Pages for glass processors in your area. Check with your recycling program first, but it is likely that clear (flint) and green glass will need to be color separated. No technology currently exists to color sort glass. For more information, contact the Glass Packaging Institute at 1-202-887-4850.

Photographic Glass Plates

Photographic glass plates are silver coated and used for very fine imaging that requires a stable surface. Currently there are no recycling programs for these. Glass plates are not considered a hazardous waste, however, and can be disposed of in a municipal landfill.

WOOD



Wood Pallets

In 1997, Kodak initiated a pallet recycling program in partnership with the Ongweoweh Corporation. The KODAK Pallet Recycling Program allows photographic processing facilities to preserve lumber resources and reduce handling and solid waste disposal costs.

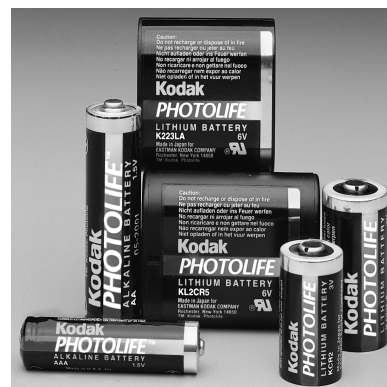
The pallet collection and recycling program is free. To request a pallet pickup, simply call 1-800-611-8743 to arrange a pickup that fits your schedule. If you are presently using pallets to ship items back to Kodak for recycling, continue to do so. This program is only for pallets that you would otherwise have to send for disposal.

Pallets that can be included for recycling are as follows:

- 48 x 40-inch Kodak pallets
- 48 x 40-inch grocery pallets
- Octagon
- 41-inch square pallets, and
- any non-Kodak pallets.

You must accumulate a minimum of 20 pallets before calling for a pickup. Stack the pallets 10 high and accumulate a minimum of two stacks. This will allow for an economical and safe recycling program. Pallets are transported to a recycler and, after sorting and repair, shipped back to Kodak for reuse.

BATTERIES



Alkaline and lithium batteries

Alkaline Batteries

When alkaline batteries have exhausted their useful energy, they generally may be disposed of with your normal refuse. Concern about alkaline battery disposal has focused on the fact that they have contained mercury. With the development of “no mercury added” technology, however, and the adoption of state and federal laws requiring the use of this technology, concern about mercury has been eliminated. Under U.S. federal law, used alkaline batteries are not considered a hazardous waste. You should, however, check with your state’s department of environmental protection to see if more stringent disposal rules apply in your area.

The successful elimination of mercury from alkaline batteries has also opened the door to alkaline battery recycling. While a national alkaline battery recycling infrastructure is not in place today, U.S. battery manufacturers have made considerable progress. The availability of environmentally improved recycling technology,

however, is believed to be at least several years away. A few companies may accept alkaline batteries for limited recovery and then disposal (contact the National Electrical Manufacturers Association—Dry Battery Section at 1-703-413-3200 for a list of companies in the U.S.). There may also be a dry cell battery collection program in your community. Check with your local solid waste department.

Lithium Batteries

There is no state or federal regulation or law that specifically regulates the disposal of individual used (energy depleted) lithium batteries sold by Kodak. However, if the lithium battery is connected to a circuit board, EPA does prohibit the disposal of this unit with the lithium cell still attached. A few municipalities have established local battery collection programs targeted at specific battery materials other than lithium, but these programs typically accept the lithium cells to avoid consumer confusion. If such local collection programs are available, obtain program guidelines from the community sponsors and participate as necessary.

Nickel-Metal Hydride Batteries



The U.S. Environmental Protection Agency does not regulate the disposal of nickel-metal hydride batteries, however, the state of California does address the disposal of nickel substances in their hazardous waste regulations. Commercial or business operations are required to handle the disposal of nickel-metal hydride batteries as a hazardous waste if they are not recycled.

While there is not a specific program available in the U.S. to recycle nickel-metal hydride batteries, this type can easily be combined with nickel cadmium batteries for recycling. Some communities have also established battery collection programs that capture the older, high mercury concentration alkaline batteries from the household solid waste stream. These collection programs typically accept rechargeable batteries as well.

Nickel Cadmium Batteries

For information on nickel cadmium batteries, refer to KODAK Publication No. J-411, *Dealing with Hazardous Waste and Processing Effluents at Photographic Processing Facilities*, which details regulations for their recovery and disposal.

RECYCLERS

To get more information on recycling various materials, consider contacting the following organizations:

Alliance of Foam Packaging Recyclers
2128 Espey Court, Suite 4
Crofton, MD 21114
410-451-8340
www.epspackaging.org

American Forest & Paper Association
1111 19th Street N.W., Suite 800
Washington, DC 20036
202-463-2700
www.afandpa.org

American Plastics Council
1801 K Street, N.W., Suite 701L
Washington, DC 20006-1301
202-974-5400
www.plastics.org

Fibre Box Association
2850 Golf Road
Rolling Meadows, IL 60008
847-364-9600
www.corrugated.org

FPC, Inc., A Kodak Company
6677 Santa Monica Blvd.
Hollywood, CA 90038
323-468-5774
www.fpcfilm.com

Glass Packaging Institute
1627 K Street, N.W., Suite 800
Washington, DC 20006
202-887-4850
www.gpi.org

National Electrical Manufacturers Association
1300 N. 17th Street, Suite 1847
Roslyn, VA 22209
703-841-3200
www.nema.org

National Wooden Pallet & Container Association
1800 N. Kent Street, Suite 911
Arlington, VA 22209-2104
703-527-7667
www.nwpca.com

Polystyrene Packaging Council
1801 K Street, N.W., Suite 600K
Washington, DC 20006-1301
202-974-5200
www.polystyrene.org

Steel Recycling Institute
1667 K Street, N.W., Suite 460
Washington, DC 20006
1-800-937-1226
www.recycle-steel.org

KODAK RECYCLING PROGRAMS

Below is a quick guide to Kodak recycling programs. Waste management assistance is also available 24 hours a day online at www.kodak.com/go/kes. Or, you may contact Kodak Environmental Services at 1-716-477-3194 (8:00 a.m. – 5:00 p.m. Eastern time). See www.fpcfilm.com for information on preservation, recycling, and destruction of motion picture film.

KODAK Program	Kodak Phone Number	KODAK Publication
KODAK Film Recycling Program (PET/silver-halide film)	1-888-685-0537	CIS-164, <i>Silver Refining at Kodak</i>
Antipiracy/Destruction Program (motion picture print film)	1-323-468-5774	Call FPC, Inc., A Kodak company, for more information
KODAK Silver Recovery (silver flake from electrolytic silver-recovery units and other silver-rich materials)	1-888-685-0537 (for current pricing and accountability); 1-716-477-3194 (for list of metal refiners/buyers)	CIS-164, <i>Silver Refining at Kodak</i>
KODAK Dental Film Lead Recycling Program	1-800-933-8031	D3-65, <i>See How Easy It Is to Get the Lead Out</i> D3-66, <i>Kodak Helps You Get the Lead Out</i>
KODAK Film Container Recycling Program	1-800-242-2424	CIS-180, <i>Instructions for Labs that Process More Than 250 Rolls Per Day</i> CIS-182, <i>Instructions for Labs that Process Less Than 250 Rolls Per Day</i>
KODAK Returnable Drum Program	1-800-242-2424	CIS-139, <i>KODAK Returnable Drum Program</i> PF3 555, <i>KODAK Returnable Drum Program</i>
KODAK One-Time-Use Camera Recycling Program	1-800-847-8755	A7-340, <i>Recycling One-Time-Use Cameras</i>
KODAK Roll Paper Fiber Core Recycling Program	1-800-242-2424	PF3-561, <i>Roll Paper Fiber Core Recycling Program</i>
KODAK Pallet Recycling Program	1-800-611-8743	Call for more information



MORE INFORMATION

If you have environmental or safety questions about Kodak products or services, contact Kodak Environmental Services at 1-716-477-3194, between 8 a.m. and 5 p.m. (Eastern time) or visit KES on-line at www.kodak.com/go/kes.

Kodak also maintains a 24-hour health hotline to answer questions about the safe handling of photographic chemicals. If you need health-related information about Kodak products, call 1-716-722-5151.

For questions concerning the safe transportation of Kodak products, call Kodak Transportation Services at 1-716-722-2400.

Additional information is available on the Kodak website and through the U.S.A./Canada faxback systems.

The products and services described in this publication may not be available in all countries. In countries other than the U.S., contact your local Kodak representative, or your usual supplier of Kodak products.

The following publications are available from Kodak Customer Service or from dealers who sell Kodak products.

- J-208 *Introducing the 'Silver Management' Series*
- J-314 *Indoor Air Quality and Ventilation in Photographic Processing Facilities*
- J-410 *An Introduction to Waste Management Options for Photographic Processing Facilities*
- J-411 *Dealing with Hazardous Waste and Processing Effluents at Photographic Processing Facilities*

For more information about Kodak Environmental Services, visit Kodak on-line at:
www.kodak.com/go/kes

Many technical support publications for Kodak products can be sent to your fax machine from the Kodak Information Center. Call:
U.S. 1-800-242-2424, Ext. 33 / Canada 1-800-295-5531
—Available 24 hours a day, 7 days a week—

If you have questions about Kodak products, call Kodak.
In the U.S.A.:
1-800-242-2424, Ext. 19, Monday–Friday
9 a.m.–7 p.m. (Eastern time)
In Canada:
1-800-465-6325, Monday–Friday
8 a.m.–5 p.m. (Eastern time)

This publication is a guide to the Federal Environmental Regulations that apply to a typical photographic processing facility. Local or state requirements may also apply. Verify the specific requirements for your facility.

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EASTMAN KODAK COMPANY • ROCHESTER, NY 14650

Waste Prevention and Recycling for
Photographic Processing Facilities
KODAK Publication No. J-412

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