POLLUTION PREVENTION

Waste Reduction Assistance In Printing and Publishing Operations

Provided by:

Pinellas County

Department of Environmental Management

Pollution Prevention and Resource Recovery Program

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Pinellas County Department of Environmental Management's

V I S I O N

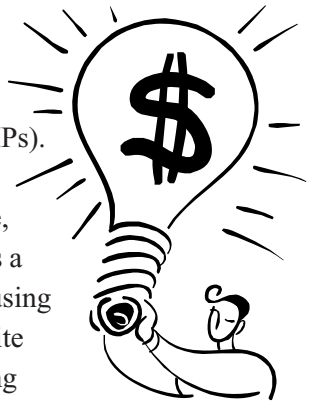
The Department of Environmental Management is dedicated to providing responsible leadership necessary to manage our natural and urban environment to meet the needs of our present and future Pinellas County citizens.

Pinellas County
ENVIRONMENTAL MANAGEMENT

About This Manual

This manual is designed to assist printing and publishing businesses with waste reduction in operations. Excessive waste is an indicator of inefficient use of raw materials and resources. Through proper education and training, business can minimize the amount of liquid, solid, and gaseous waste in Pinellas County, while improving their economic viability.

Manuals are developed by the Pollution Prevention and Resource Recovery Section (P2R2) of the Pinellas County Department of Environmental Management, a non-regulatory program that provides waste reduction technical assistance. Program staff provide information on new technologies, process modifications, substitute products, and current industry-specific Best Management Practices (BMPs). Staff can assist businesses in their efforts to become more efficient, profitable, and competitive, while complying with regulatory requirements. As a Pinellas County business, no fees are charged for using the Pollution Prevention Program's services. On-site waste reduction assistance is available by contacting program staff at (727) 464-4761.



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Introduction

The 1990 Clean Air Act Amendments (CAAA) require many industries to reduce emissions of volatile organic compounds (VOCs) and hazardous air pollutants (HAPs). Regulatory requirements could increase operating cost while business competition and the costs to produce goods and services continue to rise on an annual basis. In fact, increased competition demands reducing costs.

EPA estimates over 3,000 printing plants exist in Florida which makes up 5% of the total number in the entire United States. The Toxic Release Inventory (TRI) indicates that 99% of the printing industry's total pollutant releases is to the air. This release profile differs significantly from other TRI industries which average approximately 60% to air, 30% to land, and 10% to water release respectively. The prevalence of volatile chemicals explains the air intensive toxic chemical loading of the printing industry. According to the list, the four top toxic chemicals released – toluene, methyl ethyl ketone, xylene, and 1,1,1-trichloroethane – are all solvents of high volatility. The largest toxic chemical used (released/transferred) by the printing industry is the solvent toluene; toluene comprises roughly 70% of the total chemicals released and transferred by the industry. Toluene is used heavily in the gravure printing process as an ink solvent but is also used throughout printing for cleaning purposes.

EPA's Title III MACT printing and publishing regulation covers publication rotogravure printers that produce saleable paper products such as catalogues, magazines, newspaper inserts, and telephone directories. The standard also includes package-product rotogravure printers and wide-web flexographic facilities that print on paper, plastic film, metal foil, and vinyl for use in products such as flexible packaging, labels, gift wrap, floor coverings, and decorative laminates. Air toxics are released from the ink systems used by these types of printers. According to the regulation, existing affected facilities must comply with the standard by May 30, 1999. All new facilities must comply at startup.

Best Management Practices (BMPs) and new technologies are available that offer manufacturers an opportunity to comply with the regulations and reduce emissions while saving money and improving efficiency.

Waste reduction practices can:

- ✶ Reduce the use of raw materials
- ✶ Minimize the expense of waste disposal
- ✶ Reduce the exposure of workers and the general public to hazardous and toxic materials
- ✶ Reduce the threat of product liability
- ✶ Maximize compliance with environmental regulations and requirements

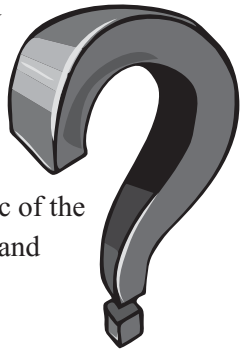
By practicing waste minimization you can improve your bottom line while increasing your business' competitive ability.

What is pollution prevention?

It is the reduction or elimination of pollutants or wastes at the source. The idea behind pollution prevention is to avoid producing the waste in the first place. If the waste is not produced, then you don't have to worry about storage or disposal problems. Having less waste means a better environment for all of us.

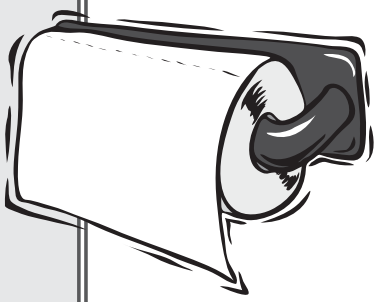
Why Should You Consider Waste Minimization and Pollution Prevention?

Waste can result from commercial printing activities such as platemaking, image processing, printing, and finishing. Some of these wastes may be classified as hazardous by federal or state regulations and others, while not necessarily hazardous, could damage the environment if not handled properly. Whatever characteristic of the waste, all waste represents **loss of resources** and **loss of money**.



Types of wastes from commercial printing could include:

- ✶ waste paper
- ✶ lubricating fluids
- ✶ chemicals, inks, and solvents
- ✶ dirty rags
- ✶ filters
- ✶ absorbents
- ✶ process wastewater
- ✶ printing plates
- ✶ empty product containers



The most effective way to minimize the losses associated with waste is to avoid producing the waste in the first place.

Pollution prevention is one approach to reducing toxic HAPs and solvent VOC emissions, and is more cost effective than installing control devices. Waste reduction techniques include:

- ✶ Improved operation and maintenance
- ✶ Use of new technologies
- ✶ Use of substitute chemicals
- ✶ Inventory management
- ✶ Water and chemical conservation

✶ Production process modification

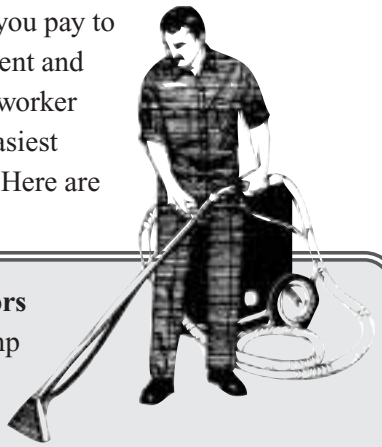
✶ On-site recovery, recycling, and reuse

What can you do?

Many pollution prevention practices are low-cost and low-risk alternatives to help minimize waste and the resulting disposal costs. Most of the approaches are based on common sense and do not require sophisticated technology. This booklet contains some ideas to get you started. Your shop may already be using pollution prevention practices without realizing it!

Keep it clean!

Poor housekeeping results in spills and overflows. This may double your expense by making you pay to replace lost material and also for its treatment and disposal. It can also lead to accidents and worker injury. Good housekeeping is one of the easiest and least expensive ways to reduce waste. Here are some tips:



✶ **Keep your shop clean and your floors dry.** Sweep floors and use dry or damp clean-up techniques (preferably dry). For example, use absorbent material for spills and if necessary, use a very small volume of water for final cleanup. This material should then be disposed of properly.

✶ **Practice good inventory control.** Mark the purchase date on containers and adopt a "first in, first out" policy, so that older materials are used up before new ones are bought.

✶ **Keep all containers closed and properly labeled.** Uncovered containers can add to product losses from evaporation, spillage, or drying out of contents (Don't forget the risk of hazardous air emissions).

✶ **Practice preventative maintenance to avoid future losses.** Inspect containers and equipment for leaks weekly.

✶ **Keep storage and work areas clean and well organized.**

✶ **Do not mix hazardous chemicals with non-hazardous chemicals.** Waste streams should be kept separate. Otherwise all of the waste will have to be treated as a hazardous waste. This can be very expensive.

Photoprocessing

The first step in most printing operations usually involves photography of some type and the related photographic developing processes. To reduce the amount of pre-press proofs and thus the amount of photoprocessing required, consider using electronic pre-press systems.

Photographic Films

Although silver halide films are the most common type of photographic media, there are other media available. The substrates used are generally polyester, vinyl acetate, or glass.

✶ **Silver halide films -** These are the most common. They are coated with a photographic emulsion that typically includes silver halide salts suspended in a gelatin.

✶ **Vesicular films** - These are coated with a thermoplastic resin and a light-sensitive diazonium salt. These films take longer to develop but avoid silver disposal problems.

✶ **Photopolymer films** - Carbon black is used and the films are processed in a weak basic solution. These films also take longer to develop but avoid silver disposal problems.

✶ **Electrostatic films** - An electrostatic charge makes the film light sensitive, and a liquid toner brings out the image after the film is exposed to light. These films develop at about the same rate as silver halide films and offer a very high resolution. They also avoid silver disposal problems.

Developing Silver Halide Films

The development of silver halide films can be simplified into the following general steps.

Developer —> (Stop Bath) —> Fixer —> Wash —> Dry

✶ **Use of a "stop bath"** containing a weak acid, usually acetic acid, prior to the fixer can help to neutralize any alkaline developer carried over on the film.

✶ **Monitor silver concentrations in fixing baths** - Above a certain concentration level (~2 grams/liter) insoluble compounds are formed that can not be readily removed from the photographic emulsion. Use of ammonium thiosulfate can double this concentration limit (to ~4 grams/liter).

✶ **Extend the life of fixing baths**. Techniques include adding ammonium thiosulfate to the bath to double the allowable concentration of silver buildup; using an acid stop bath prior to the fixing bath; adding acetic acid to the fixing bath to keep the pH low.

✶ **Minimize process bath contamination** by using squeegees to wipe off excess liquid in non-automated processing systems before moving to the next step. It's important that they are used only after the film image has hardened.

✶ **A multi-stage rinse with counter-current flow** can be used instead of single stage rinsing. Fresh water enters the final rinse tank and then flows from there to the previous rinse tank. Wastewater flow from the first rinse tank then goes to an approved treatment system and then to sanitary sewers.

✶ **Processing chemicals can be poured into storage containers** until needed again. This is especially useful for small, manual developing operations.

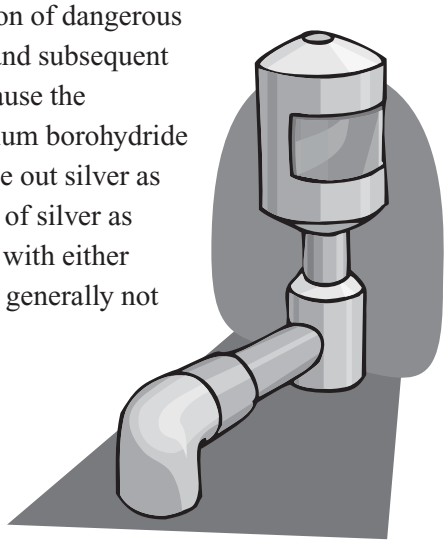
Silver Recovery from Photoprocessing Solutions

The silver contained in wastewaters from photoprocessing makes the on-site treatment of these chemicals an economical necessity for many companies, as well as an environmental requirement. This silver can be recovered in some forms and then sold. Recovery systems are commercially available and widely used.

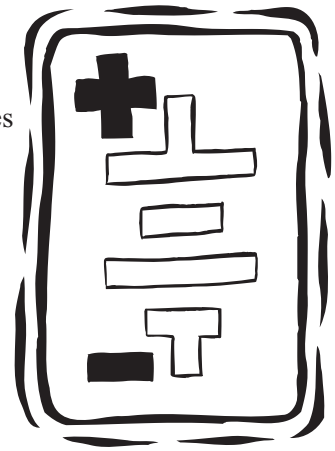
In Pinellas County the sanitary sewer standard limit for silver concentration is 2.0 mg/L.

Metallic Replacement - A more active metal, usually iron, can be used to displace the silver from solution. This can be as simple as a plastic container with steel wool or as complex as an intricate system that uses replacement cartridges and monitors concentration levels. The silver is then recovered as a sludge. However, the effluent solution now has a high iron concentration.

Chemical Precipitation - Sodium sulfide can be used to precipitate out the silver as silver sulfide. However this must be carried out in an alkaline media to prevent the formation of dangerous hydrogen sulfide gas (H_2S) and subsequent filtering can be difficult because the precipitate is very fine. Sodium borohydride can also be used to precipitate out silver as silver metal. Concentrations of silver as low as 0.1 mg/L are possible with either method, but the solutions are generally not reusable for developing.



Ion Exchange - Silver in low concentration levels can be removed by pumping the solution through an anion-exchange resin column. The silver is "trapped" in the resin column, and then be recovered on or off-site. Unfortunately recovery of the silver can be difficult, but concentration levels as low as 0.1 ppm are achievable.



Electrolytic Recovery - A controlled direct electric current is passed between two electrodes suspended in the solution. Silver then plates out on the cathode as an almost pure metal. In some cases the silver bearing solution can actually be reused. Unfortunately very low levels of silver concentration can not be achieved with this method alone, and it is often used in conjunction with one of the other treatment systems.

Off-site - Silver bearing wastes can be shipped off-site by an approved hauler for treatment and recovery at an approved facility.

Silver Recovery fromPhotographic Film or Paper

- **Silver in scrap film or paper can be removed by** treating these materials with a sodium hypochlorite solution to oxidize any silver metal. This solution can then be added to the fixer solution and the silver can be recovered in the same manner as from conventional photoprocessing waste solution. Some facilities may choose to use fixer solution that they are preparing for disposal anyway.

- **Scrap film can be sold to recyclers** for silver reclamation.

- **Scrap film or paper can be disposed of** in the trash if testing based on the Toxic Characteristic Leaching Procedure indicates levels are below permitted standards for landfill disposal.

The creation of intermediate image carriers is usually the next step in a printing process. The image is transferred to some type of "plate" that will be used in the actual printing process.

"Plate" Making

For Lithographic Printing

Lithographic plates have ink receptive areas for the image and water receptive non-image areas.

- **Replace plate making processes that involve metal** etching or electroplating with those that do not. This will help to minimize concerns about treating dissolved metals in wastewaters. Potential substitutes include: presensitized lithographic plates, plastic or photopolymer plates, flexographic plates, electrostatic plates.

- **Use waste reduction procedures for metal fabrication**, including any metal etching or electroplating processes. Contact the Pollution Prevention Program /Resource Recovery Section for more information (727) 464-4761.

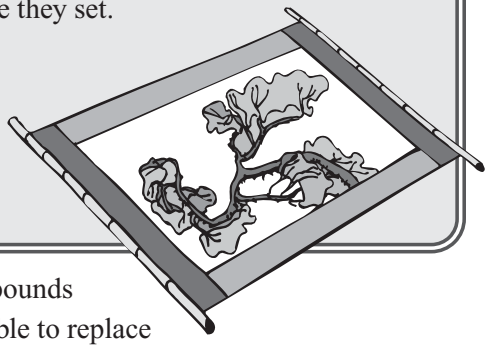
- **Photomechanical surface plates** are currently the most common image carrier and continuing to grow in use. These are made from a thin aluminum plate that has been coated with a photoreactive material. Common plate coatings are diazo compounds or photopolymer resins.

- **Electrostatic plates** are non-metallic plates (usually paper) that are coated with a photoconductor that is ionized by an electrophotographic camera. The charged paper is exposed to light reflected from the image. Areas exposed to reflected light dissipate their charge. A liquid toner is then applied to the plate and is attracted to the areas that are still charged. This forms the image on the plate. This toner now will attract ink and the rest of the paper will attract water. The process is very similar to what occurs inside a photocopier.

For Screen Printing

Porous mesh screens are coated to prevent the passage of ink through non-image areas, but still allow ink to pass freely through image areas.

- ✶ **Evaluate the use of mechanical methods** for attaching screens to a frame, instead of adhesives.
- ✶ **Evaluate the use of water-based adhesives,** instead of solvent-based ones, for attaching the screens to a frame. These adhesives allow clean-up with water before they set.
- ✶ **Use the appropriate screen size** in relation to the image to minimize the use of screen blockout.



New coatings based on diazo compounds and photopolymeric resins are available to replace bichromated coatings. These avoid toxicity problems associated with the use of chrome and its disposal.

The principle wastes generated during the make-ready /printing stages are losses due to rejects during set-up and alignment of equipment. These rejects result in wasted time, inks, and especially paper. Below are some suggestions to help reduce these wastes. Investments in equipment upgrades would have to be evaluated against the potential cost and time savings.

Press Operations

For Lithographic Printing

- ✶ **Automated plate benders** can minimize problems such as plate cracking, non-straight plate bending, curvature mismatches, etc.
- ✶ **Automated plate scanners** for determining the relative density of the image across the plates surface can be useful in setting the ink fountain keys.

- ✶ **Automated ink key setting** systems can improve print quality and reduce the number of rejects. These systems use information from plate scanners and ink density sensors to automatically adjust the ink profile for each ink slide position.

- ✶ **Sensors that measure the ratio of ink-to-water** can be used to ensure that the proper ratio is maintained. Adjustments can then be made manually or automatically.

- ✶ **Automated registration systems** that match registration marks and adjust accordingly can help to reduce waste.

- ✶ **The use of a standard ink sequence** for jobs can help to reduce waste ink and solvents generated from the cleaning of fountains prior to a change in the ink sequence.

- ✶ **For web printers, the use of web break detection devices** that automatically shut down the system can minimize damage to equipment and also reduce waste.

- ✶ **The use of an automated system for maintaining the optimum level of ink** in the fountain can help to ensure consistent product quality throughout a run.

- ✶ **Alternative fountain solutions that contain little or no VOCs** are available. These contain substitutes such as surfactants, glycols, and glycol ethers in place of isopropyl alcohol. Adjustments will have to be made for the new wetting characteristics, but they have been used quite successfully.

- ✶ **Collect and recycle any wasted paper**.

For Screen Printing

Screen printers can use many of the principles described above for lithographic printing. This includes the use of sensors and automation for ensuring proper alignment, registration, and ensuring proper ink density, the use of standard ink sequences, etc.

Paper

Paper is perhaps the item most used by printers, and also the greatest waste generated by printers. It's a common practice for printers to purchase extra paper and run extra copies in anticipation of rejects. By operating a more efficient process and utilizing some of the options presented in this manual, printers can reduce the need for this, at a significant savings in time and material. Waste paper that is generated by printers should be segregated according to their quality for recycling. This allows the greatest profit from the possible sale of scrap paper to recyclers.

Use paper that has one or more of the following characteristics to try to increase the amount that may be recycled:

- ✶ non-de-inked
- ✶ unbleached
- ✶ made with a high content of recycled material
- ✶ made with a high "post-consumer" * content
- ✶ Glossy or colored paper is often not as readily recycled.

* *"Post-consumer" indicates that it is paper that has been collected from waste that has already been used by customers. It is paper waste that has already served its intended function and would normally be thrown out in the trash. This is contrasted with recycled paper that is from pre-consumer waste. Pre-consumer (also known as post-commercial) wastes are wastes from paper making or forming processes.*

Inks

Inks contain three main components:

Pigments - pigments are used to give the inks their different colors. The pigments used for certain colors are often the same regardless of what type of ink is being used. Many pigments are compounds that contain heavy

metals such as barium, copper, lead, cadmium, mercury, etc. Many of these heavy metals have been linked to health and environmental effects and their use and disposal are closely regulated.

Solvents or carriers - Solvents and carriers present several issues of concern.

- ✶ Wastes containing most of these solvents are considered hazardous and must be disposed of properly as such.
- ✶ They may be considered Volatile Organic Compounds and their air emissions regulated as such.
- ✶ They may be considered toxic and thus any air emissions regulated as Hazardous Air Pollutants.
- ✶ There is also the related issue of worker exposure.

Binders - Binders are typically resins of some form and generally not a concern once they have been cured (dried).

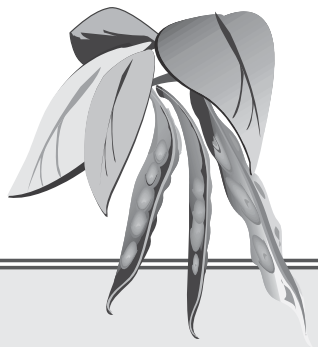
- ✶ Use inks that have been formulated with waste reduction and energy conservation in mind. Soy-based inks can replace oil-based inks in offset lithographic printing. For gravure and flexographic printing, water-based inks are gaining in popularity as pressure to curtail solvent emissions is driving the research to improve the quality of these inks.

Soybean (Vegetable) Oil-Based Inks

Vegetable oils such as linseed, canola, and soybean are being used to replace a portion of the petroleum oils found in inks.

Be careful, often formulations with a very low percentage of soybean oil content will claim to be "Soybean-based". A good guideline for soybean oil content is at least:

55% for newspaper ink
20% for sheet fed ink
18% for heat-set ink
40% for form ink



Soybean oil-based inks:

- ✶ reduce VOC emissions
- ✶ can usually be cleaned off presses easier than traditional inks when using water-based cleaners.
- ✶ offer increased coverage over petroleum inks
- ✶ flow smoother, helping to reduce start up waste

Black colored soybean oil-based inks cost more than petroleum inks, but for other colors the prices are very comparable.

Formulations with 100% vegetable oil as carrier dry slowly, but formulations with lower percentages dry at an acceptable rate.

Look closely at other ingredients listed on MSDSs, because vegetable oil-based inks may still contain pigments that pose problems associated with heavy metals content.

Ultraviolet (UV) Curable Inks

For any chemists out there, these inks contain one or more types of monomers that are crosslinked by a photosynthesizer that selectively absorbs ultraviolet energy.

The following are some advantages of UV inks:

- ✶ they do not readily cure under normal conditions but cure rapidly when exposed to ultraviolet light.

- they do not require drying ovens or racks.
- they cure very quickly under UV light, sometimes allowing an increase in production rate.
- they do not contain traditional solvents.
- they can remain in fountains and on plates for longer periods of time between runs without drying or curing and affecting quality. This reduces the need to clean the presses.

The following are some disadvantages of UV inks:

- they cost more than traditional inks.
- they may not perform as well in color matching and opacity.
- they reduce worker exposure to traditional solvents, but may pose new safety hazards such as exposure to UV light and different chemicals in these inks.
- they may still contain pigments that pose problems associated with heavy metals content.
- they may pose problems later when it comes to de-inking paper during recycling processes.

Water-Based & Water-Borne Inks

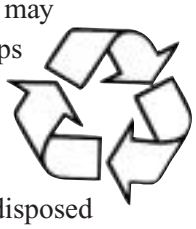
Water-based (water-borne) inks contain pigments suspended in a mixture of water and film-forming compounds. Because they **contain little or no VOCs**, generally they require more energy for drying than traditional inks. To compensate somewhat, their "ink strength" (solids content) has been increased in order to minimize the amount of water that needs to evaporate during drying. These inks **tend to be low in gloss** and **paper curl may be a problem**.

Even short periods of shutdown pose problems because the dried ink is not soluble in the liquid ink. That is, the liquid ink will not cause any dried ink to reflow on the presses. Thus, **more clean-ups may be required**.

Remember to look closely at other ingredients listed on MSDSs, because water-based inks may still contain pigments that pose problems associated with heavy metals content.

Recycling and Disposal of Inks/Printing Solutions

Usually waste inks can be collected and shipped back to the manufacturer for recycling. These inks will be mixed and used to formulate some grade of black ink that can be sold again. Printers benefit by avoiding disposal costs and may receive some type of credit or be able to purchase these inks at a lower cost than virgin ink. Color-matching systems are also available commercially to facilitate ink re-use. Small print shops may be able to coordinate ink recycling with other small shops or to send their waste ink to an ink manufacturer or larger printing plant that has a recycling program.



Waste printing solutions, inks and sludges should be disposed by an approved hauler, usually as a hazardous waste. Empty ink containers can be placed in a dumpster to be disposed of at the Pinellas County Solid Waste facility if ink residues are completely dry.

Note: For any pigmented product it is advisable to check product formulations for the presence of heavy metals. If heavy metals are contained in the pigment, the waste may be considered hazardous and require proper disposal.

Post Press Operations

After printing there are a number of operations that may be required before the final product is ready. Some of these operations may present opportunities for reducing wastes.

- ✶ **Evaluate the use of mechanical binding** methods instead of those that use glues or adhesives.

✶ **Evaluate the use of water-based glues** or adhesives instead of solvent-based ones for binding.

✶ **Collect scraps** from paper cutting or trimming so that they can be recycled.

Cleaning Operations

Cleaning operations can be messy and often use a large amount of cleaning solvents. If possible purchase solvents from a company that will pick up and recycle the spent solvent. Consider using solvents only for cleaning inks and oils; for other cleaning jobs, use soap or detergent.

Press Cleaning

Clean presses only when absolutely necessary, such as for color changes or when the press will be inactive for long periods of time between runs and the ink may dry out. Consider these measures to reduce press cleaning wastes:

✶ **Apply protective spray films** that are available to coat the top of the ink in the fountain at the end of the day. These sprays will prevent the ink from drying out or forming a skin.

✶ **Use high quality paper (preferably recycled)** to reduce paper "lint" that can require the equipment to be cleaned frequently.

✶ **Schedule jobs from lighter to darker**, if using a single press for different colors throughout the day. This will eliminate the need to clean out the fountains in order to change the ink rotation.

✶ **Use a separate container of solvent** for cleaning each color printing unit; collect the solvent and use it again for the same color to clean most of the ink from a unit.

✶ **Using soy (vegetable)-based or water-based inks** may allow clean-up with water-based cleaners instead of traditional solvents.

✶ **Evaluate the use of alternative cleaners** such as water or terpene-based cleaners that may be safer and more environmentally friendly.

✶ **Instead of dousing rags and presses with solvents** at clean-up time, try using the minimal amount of solvent. Rags can be moistened with a plunger or squeeze bottle.

✶ **If solvent is poured over equipment**, it should be collected in drip pans placed underneath. Separate drip pans should be used for each press color, so that colors are not mixed. This allows the solvent to be reused to clean most of the ink off of the presses next time with only a small amount of fresh solvent used for final clean-up.

✶ **Use parts-washing equipment as an alternative to rags** for cleaning trays that collect solvents and inks below the press rollers

✶ **Use rags rather than disposable wipes** whenever possible. Develop procedures to remove solvent from rags (gravity draining, wringing or using an explosion-proof centrifuge). If your shop is not equipped to launder the rags, commercial rag cleaning businesses are available.

✶ **If you use disposable wipes**, use a dirty wipe for the first pass and a clean wipe for the second pass. Remove as much solvent before disposal. Keep the used wipes and the spent solvent in separate containers.

✶ **Use wipes or rags as long as possible** before sending out for proper disposal or laundering. Partially soiled wipes can be used as a first pass on equipment, and clean ones as a final pass.

✶ **Store rags or wipes contaminated with solvents in closed containers** to reduce evaporation and solvent emissions. Consult the local Fire Department regarding storage.

✶ **When cleaning rollers** with a cleaning blade and solvent, use only blades and rollers in good condition. Adjust the angle of the blade so that enough pressure is placed on the roller but not so much that the blade can be grabbed" and "pulled under" the roller. Too slow a roller speed means that cleaning time will be longer and possibly more solvent will be used.

Blanket Cleaning

Alternative blanket washes are available that are less toxic and less flammable. They do not contain ingredients such as benzene, carbon tetrachloride, trichloroethylene, or methanol. These cleaners contain ingredients such as glycol ethers and heavier hydrocarbons.

Evaluate the use of automated press cleaning equipment such as automated blanket cleaners. These systems improve efficiency, reduce waste and are safer for employees.

Screen Cleaning and Reclaiming

Consider these waste reduction tips:

✶ "Squeegee" or "card" off as much ink as possible before cleaning. This ink can often be collected for reuse.

✶ Follow solvent use, storage, recycling and disposal guidelines in the "Press Cleaning" section above.

✶ High pressure water blast systems have been shown to be effective in screen cleaning. These systems can be used with water only or in conjunction with a small quantity of ink degradent and emulsion remover. Any rinsewater must be collected and sent to an approved treatment system.

✶ Totally enclosed systems are available for cleaning inks only or for removing all coatings from screens.

✶ Any wastewater from screen cleaning must meet sanitary sewer standards before discharge to sanitary sewers. No discharges of industrial wastes are allowed to go to septic tanks.

✶ Consider the disposal of screens if screen reclamation activities require too much labor, materials, and regulatory monitoring. Generally, they may be disposed of in the trash after they are dried.

✶ Minimize the use of ghost/haze removers whenever possible. Many can cause screens to become brittle and tear easily, as well as contribute significant hazardous materials to the waste streams.

Recycling and Disposal of Cleaning Wastes

✶ A distillation unit can be used to recover solvents for reuse. Using a single solvent for all cleaning operations will make recovery easier. Any distillation residues must be disposed of properly as a hazardous waste.

✶ Solvent wastes that are not recycled should be shipped out by an approved hauler, usually as a hazardous waste.

✶ Empty solvent containers may be disposed of by punching holes in the empty containers and placing them in a dumpster sent to a local landfill. These containers must be empty of any solvent.

✶ Wastewaters from any press or screen cleaning operations can be discharged to sanitary sewers if sewer discharge standards are met. Contact your local sewer department for a copy of Sanitary Sewer standards. No industrial wastes can be discharged to septic tanks.

✶ Rags can be sent to a permitted industrial laundering facility, or shipped out for proper disposal, usually as a hazardous waste.

Hazardous Materials Storage

Below are some suggestions for storage of hazardous materials:

- ✶ **Store on an impervious (sealed) surface**, i.e. resists infiltration or corrosion by the stored materials.
- ✶ **Store under cover**, whether indoors or outdoors, to keep out the rain. Check with the Fire Department.
- ✶ **Provide some type of secondary containment** that will hold up to 110% of the largest container stored in the area. This area should be able to catch and contain any leaks or spills.
- ✶ **Label waste containers properly**, including contents and date of generation for any hazardous wastes.
- ✶ **Make sure drums are easily accessible** but not stored in high traffic areas where they can be easily knocked over.
- ✶ **Be sure containers are properly sealed**. Regularly check for any signs of leak, rust, etc.

What To Do With Hazardous Waste

- ✶ **Keep all records of hazardous waste handled** on-site for at least three (3) years. This includes amounts purchased, stored, reused, and hauled away.
- ✶ **Hazardous waste should be shipped out by a properly permitted hauler** to an EPA-approved treatment, storage, and disposal facility. Check for all the proper local, state, and federal licenses. Contact the Pollution Prevention Resource Recovery (P2R2) program for a list of approved haulers.

✶ **The facility generating the waste should obtain an EPA identification number** from the address below, unless officially classified as a "Conditionally Exempt Small Quantity Generator."

Florida Department of Environmental Protection
Southwest District
Hazardous Waste Management
3804 Coconut Palm Dr.
Tampa, FL 33619-8318
(813) 744-6100

References

Assistance Centers and Resources

Pinellas County

Department of Environmental Management,
Pollution Prevention Resource Recovery (P2R2) Program: (727) 464-4761
Air Quality Division: .....(727) 464-4422

Household Electronics and Chemical Collection Center
24 hour Hotline:.....(727) 464-4623
Utilities/Solid Waste: .....(727) 464-7500

State of Florida

Department of Environmental Protection
Main Switchboard: .....(813) 744-6100
Hazardous Waste Compliance Assistance Program: .....(800) 741-4337
Emergency State Warning Point: .....(800) 320-0519
Florida Small Business Assistance Program:.....(800) 722-7457
Pollution Prevention Information Clearinghouse: .....(202) 260-1023
Earth's 911 for Community Assistance:.....(800) 947-3873
Southern Waste Information Exchange (SWIX):.....(800) 441-7949

United States

Environmental Protection Agency
Region IV, Atlanta:.....(404) 562-9900
Small Business Assistance Ombudsman:.....(800) 368-5888
Waste Reduction Resource Center: .....(800) 476-8686
Education and Outreach: .....(800) 241-1754
RCRA/Superfund Hotline:.....(800) 424-9346

Occupational Safety and Health Administration (OSHA): (813) 626-1177
Recycling Hotline: .....(800) 947-3873

Additional assistance is also available through your industrial associations:

Screenprinting and Graphic Imaging Association
International (SGIA) .....(703) 385-1335
10015 Main Street .....Fax: (703) 273-2870
Fairfax, VA 22031.....***http://www.sgia.org***

Design for the Environment Homepage ..***http://www.epa.gov/opptintr/dfe***

Printing Association of Florida .....(800) 331-0461
.....***http://www.pafgraf.org***

Graphic Arts Technical Foundation (GATF) .....(800) 910-4283
.....***http://www.gatf.org***

The P2R2 Program can provide additional resources regarding project funding, energy efficiency, product/equipment technology, and technical assistance. For information, contact our program at (727) 464-4761.

The P2R2 Section was developed to minimize the amount of liquid, solid, and gaseous pollution as well as energy & water consumption within Pinellas County.

If you are interested in the economic & environmental benefits of reducing wastes in your business, please contact the P2R2 Section at (727) 464-4761.

Pinellas County
ENVIRONMENTAL MANAGEMENT

NOTES

The **P2R2** Section's mission is to minimize the amount of liquid, solid and gaseous pollution as well as energy & water consumption within Pinellas County.

For any additional information, please contact the Pinellas County Department of Environmental Management Pollution Prevention and Resource Recovery Program at **(727) 464-4761**.

Pinellas County Department of Environmental Management
512 S. Ft. Harrison Avenue
Clearwater, FL 33756

Pinellas County

www.pinellascounty.org

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