

3.13.1 Printing Industry:

Lithography, Flexography, Gravure, or Letterpress Printing

Tip Sheet #1

WASTE ORIGIN: Platemaking

WASTE TYPES: Damaged Plates, Developed Film, and Outdated Materials

WASTE REDUCTION METHODS:

- ! Increase use of **electronic imaging**.
- ! Consider using **laser platemaking**.
- ! Use **automatic plate processors** to monitor bath conditions and automatically replenish chemicals.
- ! Use **pre-sensitized lithographic plates** processed with water only.
- ! Use **plastic or photopolymer plates** processed with a water-based solution.
- ! Use **electrostatic-paper plates** made directly from art work and used on duplicator presses.
- ! Use **water-based developers**.
- ! Use **non-chromate etchants**.
- ! Prolong **oxidation process baths** by reducing air exposure.
- ! Recycle **spent plates**.

Sources:

Environmental Management and Pollution Prevention: A Guide for Photo Processors, Washington State Department of Ecology, September 1994, Publ. 94-138.

Facility Pollution Prevention Guide, U.S. EPA, May 1992, EPA/600/R-92/088.

Guides to Pollution Prevention: The Commercial Printing Industry; U.S. EPA, August 1990, EPA/625/7-90/008.

Hazardous Waste Management for Printers, New York DEC, Division of Hazardous Substances Regulation, Bureau of Pollution Prevention, September 1991 Draft.

Hazardous Waste Reduction Facts: General Commercial Printers, City of Santa Monica, Dept. of General Services.

Pollution Prevention Opportunities in Printing, U.S. EPA Region III, October 1990.

Printing: Pollution Prevention Opportunities Checklist, Industrial Waste Section, County Sanitation Districts of Los Angeles County, Whittier, CA, December 1990.

Hazardous Waste Reduction Facts, General Commercial Printers, City of Santa Monica Dept. of General Services.

Pollution Prevention: Strategies for the Printing Industry, Center for Hazardous Materials Research.

Fact Sheet: *Removing Solvent and Ink from Printer Shop Towels and Disposable Wipes*, MNTAP, 8/91-37.

Fact Sheet: *Waste Reduction for the Commercial Printing Industry*, CA Dept. of Health Services, Toxic Substances Control Program, Alternative Technology Division, April 1990.

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Tip Sheet #2

WASTE ORIGIN: Platemaking

WASTE TYPES: Acids, Alkali, Solvents, Plate Coatings, Developers, and Rinsewater

WASTE REDUCTION METHODS:

- ! Use **washless processing** systems.
- ! Use better **operating practices** (e.g, frequently monitor bath pH, temperature, and solution strength to extend life).
- ! Use **floating lids** on bleach and developer tanks.
- ! Use **countercurrent washing** sequence instead of parallel rinse systems.
- ! **Reduce drag-out** (e.g., use drain boards; remove plates slowly and smoothly, place parts on racks to maximize drainage, maximize drip time to the extent that plate quality is not affected).
- ! Use **squeegees** to reduce carryover.
- ! Substitute **iron-EDTA** for ferrocyanide.
- ! Remove **heavy metals** from wastewater.
- ! Recover **silver** and recycle chemicals.

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Environmental Management and Pollution Prevention: A Guide for Photo Processors, Washington State Department of Ecology, September 1994, Publ. 94-138.

Facility Pollution Prevention Guide, U.S. EPA, May 1992, EPA/600/R-92/088.

Guides to Pollution Prevention: The Commercial Printing Industry; U.S. EPA, August 1990, EPA/625/7-90/008.

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Hazardous Waste Reduction Facts: General Commercial Printers, City of Santa Monica, Dept. of General Services.

Pollution Prevention Opportunities in Printing, U.S. EPA Region III, October 1990.

Printing: Pollution Prevention Opportunities Checklist, Industrial Waste Section, County Sanitation Districts of Los Angeles County, Whittier, CA, December 1990.

Hazardous Waste Reduction Facts, General Commercial Printers, City of Santa Monica Dept. of General Services.

Pollution Prevention: Strategies for the Printing Industry, Center for Hazardous Materials Research.

Fact Sheet: *Removing Solvent and Ink from Printer Shop Towels and Disposable Wipes*, MNTAP, 8/91-37.

Fact Sheet: *Waste Reduction for the Commercial Printing Industry*, CA Dept. of Health Services, Toxic Substances Control Program, Alternative Technology Division, April 1990. *Waste Reduction Tips for Printshops*, Alaska Health Project, 1987.

Fact Sheet: *Opportunities for Printers to Reduce Image Processing Costs by Minimizing Waste and Recovering Silver*, University of Wisconsin-Extension, Solid and Hazardous Waste Education Center. 425.WP.9604, 1996.

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Tip Sheet #3

WASTE ORIGIN: Makeready

WASTE TYPES: Waste Ink and Wastepaper

WASTE REDUCTION METHODS:

EQUIPMENT:

- ! Use **automatic plate benders**, scanners, or other plate fitting parameters affecting proper registration.
- ! Use **automatic plate scanners** for web or sheet-fed offset presses.
- ! Use **automatic ink key** setting systems.
- ! Use **automatic (computerized) registration** systems for gravure, web offset, etc.
- ! Use **ink/water sensors** to optimize ratio.
- ! Install **web break detectors**.
- ! Use **automatic web splicers**.

PROCESS:

- ! Implement accurate **counting methods**.
- ! Prepare only the **quantity of ink** needed for a press run.
- ! Clean **ink fountains** only if different color is used or if ink might dry out between runs.
- ! Return **unemulsified inks** to their containers.
- ! Donate **unemulsified inks** to trade schools, colleges, etc.
- ! Use **water-based ink or water-borne inks** instead of solvent-based inks when possible (not applicable to lithography).
- ! If you must use solvent-based inks, choose **low-VOC inks**.
- ! Use inks with low or zero levels of **toxic metals** (lead, barium, cadmium, chromium).
- ! Use **soybean oil inks** if possible.
- ! Use **UV-curable ink**.
- ! Use **Electron Beam Drying** on web presses.
- ! Prevent **ink drying and skin formation** through non-drying aerosol sprays.
- ! Test use of **non-skinning ink** formulations.
- ! Store and **reseal ink** properly.
- ! Save **old inks** and market as "house" colors.
- ! Recycle **waste ink** (e.g., to make black ink); smaller operations can coordinate with large plants or newspapers (using rubber/oil based ink) to recycle.
- ! Return liquid **ink to supplier** to be recycled as feedstock.

Sources:

Facility Pollution Prevention Guide, U.S. EPA, May 1992, EPA/600/R-92/088.

Guides to Pollution Prevention: The Commercial Printing Industry; U.S. EPA, August 1990, EPA/625/7-90/008.

Hazardous Waste Management for Printers, New York DEC, Division of Hazardous Substances Regulation, Bureau of Pollution Prevention, September 1991 Draft.

Hazardous Waste Reduction Facts: General Commercial Printers, City of Santa Monica, Dept. of General Services.

Pollution Prevention Opportunities in Printing, U.S. EPA Region III, October 1990.

Printing: Pollution Prevention Opportunities Checklist, Industrial Waste Section, County Sanitation Districts of Los Angeles County, Whittier, CA, December 1990.

Hazardous Waste Reduction Facts, General Commercial Printers, City of Santa Monica Dept. of General Services.

Pollution Prevention: Strategies for the Printing Industry, Center for Hazardous Materials Research.

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Fact Sheet: *Waste Reduction for the Commercial Printing Industry*, CA Dept. of Health Services, Toxic Substances Control Program, Alternative Technology Division, April 1990.

Waste Reduction Tips for Printshops, Alaska Health Project, 1987.

Fact Sheet: *Lithographic Ink Wastes: How to Reduce, Reuse, and Recycle Ink Waste*, University of Wisconsin-Extension, Solid and Hazardous Waste Education Center. 425.WP.9508, 1966.

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Tip Sheet #4

WASTE ORIGIN: Printing and Finishing Operations

WASTE TYPES: Lubricating Oils, Test Production, Waste Inks, Bad Printings, Clean-up Solvent, Empty Ink Containers, Rags, and Used Blankets

WASTE REDUCTION METHODS:

- ! Install **web break detectors**.
- ! **Monitor press** performance.
- ! Check **roller blade** condition and angle.
- ! Use better **operating practices**.
- ! Improve **start-up** procedures.
- ! Use **fountain solutions** that do not contain isopropyl alcohol (IPA) or have low concentrations of IPA.
- ! Use **automatic ink leveler**.
- ! **Schedule runs** to reduce color changeover (e.g., use standard ink sequence to eliminate the need to change ink rotation, fountain cleaning).
- ! **Do not mix** hazardous solvent/ink wastes with non-hazardous solvent/ink wastes.
- ! Use **automatic blanket cleaning** systems.
- ! Use **alternative solvents** (e.g., less-toxic or less flammable blanket washes — acetic acid, hexane, or detergent based).
- ! Use **soaps and detergents** instead of solvents when possible.
- ! **Wipe off excess ink** before cleaning equipment with solvents.
- ! Use **solvents only** for cleaning inks and oils.
- ! Draw **only enough solvent** needed to complete cleaning task. Control solvent use by using plunging cans that moisten but do not soak towels, or by using squeeze bottles to moisten towel.
- ! Apply **solvent directly to roller blanket** with squeeze bottle.
- ! Use **press wipes** as long as possible; use dirty wipes for the first pass, and clean wipes for the second.
- ! Physically **dry wiper rags** (squeegee or spin, use hand-operated or mop wringer, explosion proof centrifuge, hand squeeze); **recover or recycle squeezings and drippings**, send dirty rags to approved industrial laundries.
- ! Install **solvent hoods** to recapture solvent losses from presses.
- ! Clean trays in a **parts washing unit** using recirculating solvent.
- ! **Separate solvent** according to color and type of ink. Reuse collected wastes to thin future batches of same ink.
- ! Recycle **waste solvent**.
- ! Separate and recycle **used oil**.

Sources:

Facility Pollution Prevention Guide, U.S. EPA, May 1992, EPA/600/R-92/088.

Guides to Pollution Prevention: The Commercial Printing Industry; U.S. EPA, August 1990, EPA/625/7-90/008.

Hazardous Waste Management for Printers, New York DEC, Division of Hazardous Substances Regulation, Bureau of Pollution Prevention, September 1991 Draft.

Hazardous Waste Reduction Facts: General Commercial Printers, City of Santa Monica, Dept. of General Services.

Pollution Prevention Opportunities in Printing, U.S. EPA Region III, October 1990.

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Hazardous Waste Reduction Facts, General Commercial Printers, City of Santa Monica Dept. of General Services.

Pollution Prevention: Strategies for the Printing Industry, Center for Hazardous Materials Research.

Fact Sheet: *Removing Solvent and Ink from Printer Shop Towels and Disposable Wipes*, MNTAP, 8/91-37.

Fact Sheet: *Waste Reduction for the Commercial Printing Industry*, CA Dept. of Health Services, Toxic Substances Control Program, Alternative Technology Division, April 1990.

Waste Reduction Tips for Printshops, Alaska Health Project, 1987.

Fact Sheet: *Management of Solvents and Wipes in the Printing Industry*, University of Wisconsin-Extension, Solid and Hazardous Waste Education Center. 425.WP.9410, 1994.

Fact Sheet: *Waste Reduction Opportunities for Printers*, University of Wisconsin-Extension, Solid and Hazardous Waste Education Center. 425.WP.9408, 1994.

Fact Sheet: *Opportunities for Printers to Reduce Image Processing Costs by Minimizing Waste and Recovering Silver*, University of Wisconsin-Extension, Solid and hazardous Waste Education Center. 425.WP.9604, 1996.

Fact Sheet: *Lithographic Ink Wastes: How to Reduce, Reuse, and Recycle Ink Waste*, University of Wisconsin-Extension, Solid and Hazardous Waste Education Center. 425.WP.9508, 1995.