



- Guidelines for Commercial Printers - *Management of Leased Towels*

FACT SHEET

Background

Many commercial printers use leased towels saturated with solvents for press cleanup. Solvents are effective at quickly removing press contaminants. However, the disadvantages of solvent use include high purchase cost, potential of worker exposure, and associated waste management regulations and costs.

High levels of inks and solvents on towels can create an effluent problem not only for the launderers that contract to clean leased towels but also for the local municipal wastewater treatment plant (WWTP). Launderers are responsible for wastewater discharges that result from wastes on the towels and must meet stringent wastewater discharge limits. Waste reduction strategies implemented by printers can benefit their own operations and, in turn, towel launderers and the local WWTP.

Pollution Prevention Techniques

Numerous pollution prevention techniques are available that can reduce solvent usage, waste management costs, and environmental releases. These techniques range from relatively simple housekeeping practices to the installation of on-site solvent recycling equipment.

✓ Improved Housekeeping

A printing company can realize significant benefits by simply implementing and/or improving housekeeping practices as outlined below.

- **Keep lids closed on containers.** Closed containers prevent ink skinning solvent evaporation, material contamination, and spillage. The ink/solvent in a container should be used completely before a new container is opened; operators should remove only the amount needed to complete the current task and reseal the covers when finished.
- **Segregate waste.** Recyclables (e.g., cardboard, paper, and inks) and trash should be kept out of the towel containers. *Hazardous waste should not be allowed to mix with nonhazardous wastes or recyclables.* Federal and state laws prohibit dumping of waste solvent (hazardous waste) into the bins containing dirty towels (recyclable). Unused ink portions should be separated and kept for reuse in “house” colors or for mixing to black.



Minimize **spills and use dry cleanup methods.** Increased employee awareness of the problems associated with solvent usage could significantly decrease solvent misuse. Employees should be trained in proper machine operation/maintenance and provided with appropriate equipment so that they correctly dispense, deliver, and mix materials for press operations. Initially, excess liquids should be removed with squeegees or doctor blades from equipment surfaces before they are wiped with towels. To minimize bad

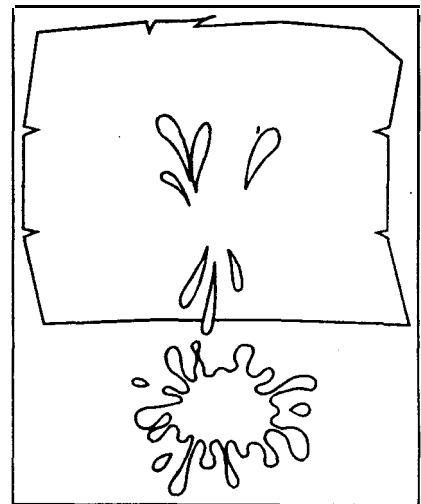
runs and material spills, investigate the purchase of continuous monitors.

- **Task Scheduling.** Similar jobs should be run simultaneously or consecutively to minimize waste generation between cleanup and the start of the next run. For example, print orders should be processed from light to dark to reduce the amount of cleaning required between runs.
- **Ink Fountains.** Ink fountains should be filled with only the quantity needed for a particular run or shift, and all unemulsified inks should be returned to their containers. Automatic ink levelers can be installed to keep the ink fountains at optimal levels for good print quality in large web presses. Clean the fountains only when colors need to be changed or when ink has dried between runs. Drying can be reduced and fountains can be left with ink overnight if they are sprayed with anti-skinning sprays, i.e., special non-drying aerosol materials.

✓ **Remove Ink/Solvent From Towels**

Incentives to remove liquid inks and solvents from towels include significant financial and environmental benefits for both the printer and the commercial launderer. A substantial quantity of inks and solvents can be removed from saturated towels by a wringer, centrifuge, or gravity drain.

- A *wringer* is used to manually squeeze out any excess liquids from the towels.
- A *centrifuge* spins the soaked towels to separate the liquids, which are then collected for reuse, recycling or disposal. The centrifuge is more costly than a manually operated wringer and must be explosion proof.
- *Dirty* towels *can* be *drained* by placing them in a commercially available 55-gallon "Dram Trainer" in which free-flowing liquids gravitate to a collection pan at the bottom of the container. The unit holds up to 200 towels.



The recovered solvents may be reused in less critical operations (e.g., cleaning press ink trays); distilled on site for reuse; sent off site for recycling, or transported to a fuel blender. Recovered inks can be mixed to black on site or sent back to the supplier for reblending. However, if the removed inks and solvents are not reused at the facility, the mixture may be classified as hazardous waste.

One commercial printer found that spinning 220 towels in one 55-gallon container yielded 2.5 to 3.5 gallons of extracted liquid. Distilling or reusing this solvent from just one container of towels would result in a new materials cost avoidance of approximately \$4 per container, a considerable savings when calculated over a whole year of towel usage. The removal of a portion of the liquid contaminants from towels results in cleaner cloths sent to the launderer and decreased levels of pollutants discharged through the launderer's wastewater treatment system.

✓ **Solvent/Ink Substitutes**

Printers could investigate the potential to substitute less volatile or less hazardous materials for solvent-based cleaners, additives, and inks. Reductions in the quantities of hazardous materials in the workplace decrease worker exposure and the company's waste management liability and costs.

1. The first step in finding a suitable solvent alternative is to set a performance standard based on solvent uses. The evaluation concerns the surfaces on which the solvents are used and the conditions under which the materials best perform. Feedback from the press operators and associated personnel is critical in determining the products needed and the performance levels. The same strategy can be used to find alternatives to solvent-based ink.

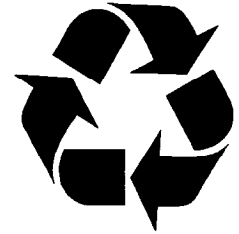


2. Once the performance criteria are established, an appropriate substitute can be selected, tested, and implemented in facility operations. Below is a brief listing of possible substitutes.

- Soap or detergent solutions for cleaning press parts.
- Solvent-free blanket wash.
- Water-based inks.
- Vegetable-oil-based inks.
- Ultraviolet and electron-beam-curable inks.

✓ Solvent or Ink Recycling

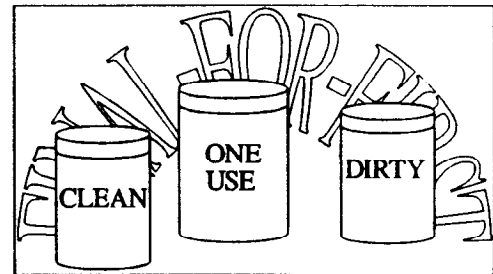
Options are available for recycling/reuse of the solvent and inks recovered from the towels and dry cleanup methods. Some printers still send waste ink and solvents off site as a waste (hazardous or non-hazardous) for disposal. However, many printers recycle their waste inks and solvents off site through their suppliers or recycle them on site with small distillation units.



- An ink recycler that mixes various colors to black can be purchased for about \$5,000. Considering virgin ink costs of at least \$1.50 per pound and waste disposal costs, the payback for a recycler can be favorable.
- Small solvent distillation units (e.g., 5-gallon capacity) can be purchased for about \$2,000. The cost of virgin solvent at \$1.30 per gallon and disposal and handling costs should be considered when payback is calculated.

✓ Final-for-First

As the last towel used to clean equipment may be the cleanest towel, reuse it as the first towel for the next equipment cleaning job. The final-for-first technique decreases costs because both wiper and solvent usage is reduced.



- Towel usage is reduced because relatively clean towels are not laundered needlessly.
- Solvent usage is reduced because relatively clean towels from the previous cleaning contain some solvent.

The final-for-first procedure can be implemented easily if three containers are placed in the towel storage area and labeled "Clean," "One-Use," and "Dirty."

✓ Spraying Towels

Before use, spray towels with solvent from common containers instead of dipping or soaking them in solvent. A wasteful practice in many facilities is to dip towels in buckets of solvent which are stored near equipment to be wiped down. Training may be needed as workers perceive that rags must be soaked for effective cleaning.

- Solvent in uncovered buckets evaporates rapidly; unneeded evaporation increases solvent releases into the workplace and environment.
- Spraying a towel instead of soaking it requires significantly less solvent.



Commercial Printer Success Story

The John Roberts Company (JRC) uses leased towels for press cleanup. The company sent its leased towels, which previously were heavily saturated with inks and solvents, to an industrial laundry. Cleaning these dirty towels created a wastewater discharge problem and employee safety hazard for the laundry. JRC looked for ways to decrease the amount of solvents and inks sent to the laundry.

Waste Reduction Activities

- Involved employees in reducing solvent usage and waste reduction. The support of management and cooperation from press personnel are essential for successful pollution prevention.
- Audited use of solvents in all operations to find a more environmentally appropriate substitute.
- Purchased (\$15,000) and installed a centrifuge to remove excess solvent from towels before laundering.

Waste Reduction/Annual Savings

- By involving management and press employees, the company reduced use of 55-gallon drums of type wash solvent from 152 to 5 drums per year.
- Savings for the first year totaled \$18,000 as a result of solvent substitution and more efficient use of existing solvents. As a result of the centrifuge installation, savings for the first year totaled \$34,000 in reduced waste management costs and raw material purchases.

This success story is a result of implementing pollution prevention to find affordable and effective solutions to waste management problems.



The North Carolina Division of Pollution Prevention and Environmental Assistance provides free, non-regulatory technical assistance and training on methods to eliminate, reduce, or recycle wastes before they become pollutants or require disposal. Telephone DPPEA at (919) 715-6500 or 800-763-0136 or e-mail nowaste@owr.ehnr.state.nc.us for assistance with issues in this Fact Sheet or any of your waste reduction concerns.

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