

SOLVENT ELIMINATION BY OFF PRESS CLEANING WITH CO₂

SUMMARY

A flexographic packaging printer eliminated the use of solvents in cleaning removable press components by switching to carbon dioxide blasting.

BACKGROUND

During press cleanup, liquid ink is first removed from the press and returned to the ink room for reblending. Press components such as ink pans and pump kits are removed from the press and replaced with clean components.

Excess ink is scraped or poured from the removed components. The remaining ink is then allowed to dry. Prior to making modifications, components were cleaned either by hand washing with solvent or in an enclosed solvent spray washer. The solvent contained no TRI listed components, but contained alcohols and petroleum distillates.

PROCESS MODIFICATIONS

The company purchased a CO₂ blasting system as an alternative to cleaning press components with solvent. The CO₂ system is similar in concept to sand blasting. Dry ice is purchased in pellet form from a local supplier. Compressed air at approximately 60 pounds per square inch is used to propel small pellets of dry ice through an insulated hose and nozzle. The dry ice strikes the press components, removing dried ink. The CO₂ pellets then quickly evaporate, leaving only the dried ink particles to be swept or vacuumed from the floor for disposal. The ink is allowed to dry prior to cleaning to prevent spattering.

RESULTS

The cost of purchasing a CO₂ blasting unit is approximately \$20,000. Operating cost is estimated to be \$26.00 per hour. A rough comparison of CO₂ cleaning with solvent cleaning is provided on the back. Estimates are based on the cleaning of six press pans and ink pumps.

Solvent Cleaning

Solvent	9 gallons @ \$2.00 per gallon	= \$18.00
Hazardous waste disposal	9 gallons @ \$.80 per gallon	= \$7.20
Rag contract service	20 rags @ \$.25 each	= \$5.00
Total		\$30.20

CO₂ Cleaning

CO ₂	75 pounds dry ice @ \$.35 per pound	= \$26.20
Compressed air	13 hp x 1 hour x .746 kW/hp x \$.08/kWh	= \$.78
Total		\$26.98

CO₂ blast cleaning can also be used to clean anilox rollers and other press equipment. Floors and press exteriors can be cleaned of dried ink, thus eliminating solvent use. Reduced volatile organic compound emissions, worker exposure to solvents, fire hazard, and reporting requirements and improvements in productivity usually further reduce the cost of CO₂ cleaning when compared to solvent cleaning.
