

Commercial Printers

Commercial printing is a major business. Printing establishments include photocopy shops, offset printers, large newspapers, and book publishers. All of them potentially use photographic techniques that once used large amounts of water.

Standards and Practices

Basic water-efficiency measures include the following:

- ◆ design the layout of the equipment for easy access.
- ◆ provide nondrying aerosol sprays to keep ink fountains from drying.
- ◆ ensure that the printing press has proper controls, such as automatic ink levelers. **PROC**

Some photo water-efficiency measures take advantage of new technology. Photo processing using self-contained “mini lab” units requires no plumbing or washing. Digital technology in large print shops now allows printers to process images directly from computer to plate. **PHOTO**

Cooling and Heating Systems

Heat generated in a manufacturing process is removed by use of cooling towers or by air-conditioning or refrigeration equipment. Energy-efficient equipment may reduce such waste heat, which is usually removed by a central refrigeration system and compressor. The compressor may be air-cooled or connected with a circulating loop to a cooling tower or evaporative condenser.

As warm water from the compressor trickles through the cooling tower, some water evaporates, cooling the remaining water, which returns to cool the equipment. Measures to reduce water waste in cooling towers include:

- ◆ performing a life-cycle analysis, including all operating, capital, and personnel costs, to determine whether use of a cooling tower is more cost-effective than air cooling.
- ◆ equipping cooling towers with conductivity controllers, make-up and blowdown meters, and overflow alarms.
- ◆ operate towers at a minimum of five cycles of concentration in regions with high water quality (low TDS)

Digital and photo processing technologies have advanced so much that printers can now process images directly from computer to plate.



Nondrying aerosol sprays and automatic ink levelers are among the advances employed by the printing industry.

for towers using potable water, depending upon the chemistry of the make-up water, including considerations for reclaimed water or on-site sources.

- ◆ avoiding once-through cooling with potable water. **FOOD**
- ◆ using high-efficiency drift eliminators that reduce drift loss to less than 0.002 percent of circulating water volume for cross-flow towers and 0.001 percent for counter-flow towers.
- ◆ evaluating the processes in the plant for maximum energy efficiency and waste-heat recovery, since a more efficient building will reject less heat to the cooling tower.
- ◆ providing adequate training to cooling-tower operators.

THERM

Additional water-efficiency measures include the following:

- ◆ operate closed-loop steam systems at twenty cycles of concentration or greater (5 percent or less of make-up water) where water chemistry allows.
- ◆ equip steam distribution lines and equipment with steam traps meeting all codes.
- ◆ install make-up meters on feed-water lines to:
 - » steam boilers and water boilers of more than 100,000 Btus per hour.
 - » closed-loop hot-water systems for heating.
- ◆ situate boiler temperature and make-up meters to be clearly visible to operators.
- ◆ reduce plumbing leaks due to repeated opening of water-temperature and pressure-relief valves (TPRVs).
- ◆ make discharge pipes easy to inspect for flow and there should be visible indicators of any valve activation. **REST, THERM**

Water Reuse and Recycling

Consider all possible opportunities for water recovery and reuse or alternative water supplies, such as filtration and membrane processes and capturing condensate drain water from air-conditioning systems. **PROC, ALT**

Water Treatment

In some cases water treatment may be used to ensure an attractive quality for the finished images. Measures to improve water efficiency in water treatment include:

- ◆ for all filtration processes, install pressure gauges to determine when to backwash or change cartridges, followed by backwash based upon pressure differential.

- ◆ for all ion-exchange and softening processes, set recharge cycles by volume of water treated or by using conductivity controllers.
- ◆ avoid use of timers for softener-recharge systems.
- ◆ use water treatment only when necessary.
- ◆ use reverse osmosis and nanofiltration systems with the lowest reject rate for their size.
- ◆ choose distillation equipment that recovers at least 85 percent of the feed water. **TREAT**



Other

Install automatic-shutoff and solenoid valves on all hoses and water-using equipment. **PROC**

Install faucets on set tubs and janitorial sinks with flows not to exceed 2.2 gpm. **REST**

TIP: Conspicuously mark fire-protection plumbing so no connections will be made except for fire protection. Additionally, install flow-detection meters on fire services to indicate unauthorized water flows. **REST**

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