

WATER CONSERVATION CHECKLIST :



TEXTILE OPERATIONS

EVERY DROP COUNTS!

GETTING STARTED

To reduce water consumption whether in an office or commercial/industrial setting, consider the three-step process below. Foremost, employees must understand how their job affects water use in their work environment. Solicit ideas from those most involved with the daily operations and activities of the organization. Make conserving water part of their job by having them identify where water is used, whether in bathrooms or manufacturing operations. Once the areas of water consumption have been determined, engage the employees to help implement conservation measures.

- Educate and involve employees on water conservation,
- Locate all water using sources (bathrooms, wash sinks, hoses, dish machines, HVAC, cooling water, etc.) in facility; and
- Identify and implement water conservation options.

IMMEDIATE AND NO OR LOW-COST CONSERVATION OPTIONS

General

- Check existing flow rates on high use process equipment and adjust accordingly.
- Reduce frequency of external equipment and flooring cleaning.
- Eliminate use of fill and drop rinsing for mixing tank and rinse with spray nozzles.
- Reduce water pressure in water lines. For every one psi drop in pressure the facility can reduce flow rates from a ¼ inch orifice by 0.12 gpm.
- Increase maximum conductivity or TDS level for blow down in cooling towers and boilers.

- Improve efforts of leak detection and repair on cooling towers, air washers and boilers.
- Check float valves on all sumps in cooling towers and air washers.
- Eliminate use of heat exchanger on make-up water for direct contact heat exchanger to reduce loss of steam from system. Cooler make-up water entering water heater condenses steam.

Batch Wet Processing

- Eliminate final rinse bath for select goods (light and white shades).
- Utilize final rinse of white and light shades for initial bath of next lot.
- Schedule dyeing of light shades prior to dark shade dyeing to eliminate need for tank boil-out.
- Dedicate white goods to selected machines to eliminate tank boil-outs.
- Reduce volume of rinse bath in drop and fill rinse stages.
- Adjust overflow rinse time; base on rinse water quality analysis.
- Shift goods requiring more cycles to lower liquor ratio dyeing equipment.
- Utilize extraction cycle between rinses.

Continuous Wet Processing

- Reduce flow rates on wet out tanks. Often these flow rates are in excess of 30 gpm while flow rates of 15 gpm or less can maintain low contaminant buildup.
- Reduce flow rates of countercurrent rinse tanks during standby mode on automated lines. Automated rinse tank systems will reduce flow rates



while the equipment is in standby mode by 10 percent or less from operational flow rates. The rates can be dropped significantly lower during standby mode to reduce wasted water.

- Adjust rinse water flow rates based on greige good quality or weight.
- Adjust tension on squeeze rollers to reduce contaminant carryover between rinse stages.

Fabric Printing

- Reduce flow rates on blanket wash system.
- Reduce timed cleaning cycle on pipe and screen cleaning system.

SHORT TERM OPTIONS

General

- Have contact and non-contact water flows regulated automatically. When machine shuts down, water flow stops for contact and non-contact purposes.
- Installation of high pressure low-volume spray nozzles. These modified spray nozzles require the attachment of a 3/8 -1/2 inch air hose with 75-250 psi, along with a 3/4-inch water line. This setup has the potential to reduce the water usage more than 50 percent in washing applications. At 75 psi these nozzles use 4 cfm of air and 4 gpm of water.
- Install equipment that facilitates consistent ratio of water to goods. Dye equipment controllers adjust water volume based on weight of goods.
- Install side stream filter on cooling towers to reduce blowdown frequency.
- Install tank system to collect once-through cooling water to be used as process makeup water or install cooling tower to recycle cooling water.
- Increase condensate recovery on boiler system.

Batch Wet Processing

- Review additives to formulations that may lead to increased rinsing requirements. For example, some stabilizers in peroxide bleaching require additional rinsing.
- Use enzymes in bleaching formulation to reduce number of rinses after bleaching.

Continuous Wet Processing

- Utilize countercurrent rinsing on wash stages and adjust flow rates accordingly.
- Reuse rinse waters from mercerizing to bleach, bleach for scour, and from scour for desize.
- Install conductivity controllers in the final rinse bath to control flow rate or program computer to adjust flow rates based on fabric weight.
- Install vacuum or squeeze rollers to improve cleaning efficiency and reduce required flow rates.
- Install filtering system on wet-out tanks to allow for continuous recycling of rinse waters.

Fabric Printing

- Install system to improve rinsing efficiency of blanket wash (i.e. spray nozzles, scrubber pads, doctor blades, etc.).
- Identify gray water from other sources that can supplant demand of blanket wash.
- Reduce length piping for color transfer to printing line or dedicate line to specific high-use colors to reduce flushing requirements.
- Reduce length of chemical transfer lines to reduce flushing.

LONG TERM OPTIONS

General

- Install air-cooled air compressors.
 - Install gas heated dry cans.
 - Install treatment systems to recycle wastewater, including the use of ultrafiltration for PVA wash water, dissolved air flotation or filtration for preparation rinse waters, nanofiltration for dye rinse waters, resin treatment of selected rinse waters, etc.
 - Install holding tanks to collect and reuse selected rinse waters.
 - Install horizontal washers which consume 1/4 of the water of vertical washers.
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Batch Wet Processing

- Use cold pad scouring, bleaching and/or dyeing.
- Install ultra-low liquor ratio, 4:1, dyeing equipment.
- Install system to collect bleaching water for reuse.

Continuous Wet Processing

- Install countercurrent rinsing systems.
- Install squeeze rollers or vacuum extractors between rinse stages.
- Install computer-controlled wet processing equipment with flow control.

SUCCESS STORIES

General

- A circular knit goods processor reduced water consumption by 300,000 gallons per month through reuse of final rinse bath of “whites” lot for initial bleach bath of next lot.
- A textile manufacturer reduced the gallons of water used per pound of cloth by an average of 23 gallons by increasing loading of machines, operating lower liquor ratio equipment, combining processes (scour/dye) in same bath, and minimizing prebleaching of shades.
- A small screenprinting operation reduced water consumption by 130 gallons per day through the installation of a reclamation tank to recycle and reuse screen-cleaning solution.
- A textile knit goods wet processor reduced water consumption by 14 million gallons per year by installing flow meters and differential pressure transmitters on all its pressure dye machines to allow for variable fill water loading based on weight of fabric to be processed.
- A textile manufacture of knit goods reduced the gallons of water used per pound of cloth processed by four gallons by installing bleaching machines that use 1/3 the volume of conventional bleach rinsing machines.
- A textile package dyeing facility reduced the gallons of water consumed per pound of cloth procedure by 52 percent by optimizing its dye cycles to reduce unnecessary rinses and process baths.
- A textile manufacturer installed a holding tank system to capture the once-through cooling water for use as dye process makeup water.
- A small bleaching operation reduced water consumption by 5,000 gallons per year through reuse of final rinse for bleach bath makeup.



The North Carolina Division of Pollution Prevention and Environmental Assistance provides free, non-regulatory technical assistance and education on methods to eliminate, reduce, or recycle wastes before they become pollutants or require disposal. Call DPPEA at (919) 715-6500 or (800) 763-0136 or e-mail nowaste@p2pays.org, or visit DPPEA's Web site at <http://www.p2pays.org> for assistance with issues in this checklist or any of your waste reduction concerns.