Dangers of Printing With Chlorine

In order to make paper “brighter,” wood fibers are often bleached with chlorine or chlorine compounds. When these bleaching agents are combined with organic matter such as wood fibers, one byproduct is dioxin, a known human carcinogen. According to the EPA’s Toxic Release Inventory report, paper production is a leading industrial source of dioxin.

In the paper bleaching process, dioxin finds its way into the environment, contaminating water, soil, and our food supply. Dioxin bio-accumulates in the fat of fish, seabirds, and mammals, and it has been associated with cancers, lymphomas, diabetes, immune system disorders, and birth defects. Health experts warn pregnant women against consuming certain types of fish because of the associated risk of dioxin contamination to a developing fetus.

Chlorine Alternatives to Green Printing
Technological advances have given us great alternatives for whitening paper. Magazine publishers can work with their paper suppliers to find a suitable paper that eliminates or minimizes the use of chlorine.

When printing, use these alternatives, beginning with the best environmental choice:

- Processed Chlorine Free (PCF) applies to recovered paper fiber and means the recycled and deinked paper fibers are whitened without any chlorine. Since we value both forest conservation and reducing unnecessary chemical use, we advocate PCF as the most environmentally preferable option.

- Totally Chlorine Free (TCF) paper is also whitened without any chlorine bleaching, but can only apply to virgin fiber paper and not to recycled paper. If TCF is the option you desire then you should make sure all virgin fiber is 100% FSC-certified, and not extracted from endangered forests or illegally logged areas.

- Enhanced ECF with ozone or hydrogen peroxide substitutes ozone or hydrogen peroxide for chlorine or chlorine dioxides as a brightening agent in the initial stages of the bleaching process. This process is inferior to PCF and TCF because it does use chlorine gas in the final stage of bleaching. However, compared to the processes outlines below, this process is preferable because it further improves the quality of the wastewater and enables recovery of most mill wastewater by 70 to 90% compared to traditional ECF.

- Enhanced ECF with extended or oxygen delignification removes more lignin from the wood before bleaching than the traditional ECF method. Therefore, fewer bleaching chemicals are required. In addition, compared with traditional ECF, this process reduces energy consumption by 30%, improves the quality of mill wastewater, and reduces the quantity of mill wastewater by nearly 50%.

- Elemental Chlorine Free (ECF) is a bleaching process that substitutes chlorine dioxide for elemental chlorine. Compared to elemental chlorine bleaching processes, ECF bleaching reduces the formation of many chlorinated organic compounds. However, it does not completely eliminate them and the quantity of effluent from mills is not reduced.Most paper mills have adopted elemental chlorine free bleaching procedures that produce less dioxin than standard chlorine bleaching. This is primarily due to the 1997 EPA “Cluster Rule” which set limits on toxics released to the air and water by the pulp and paper industry. While this rule has required improved practices, even a small amount of dioxin can wreak havoc on the environment. A “no chlorine” policy is the best policy, and publishers should aim for using the most recycled content in combination with alternatives to chlorine bleaching in order to make the biggest environmental difference. Go to the Environmental Paper Network’s Web page to read the Common Vision and the “hierarchy of pulping and bleaching technologies.”

Other Green Printing Resources

- Environmental Paper Network

- Reach for Unbleached!

- Center for Health and Environmental Justice

- Washington Toxics Coalition

- Chlorine Free Products Association

- Environmental Defense