

WARRENS WATERLESS PRINTING

ENVIRONMENTAL PRINTER IS ALSO THE DESIGNER'S CHOICE

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In 1995, Warren's became the first and only dedicated waterless printer in Canada. Waterless lithography (dryography) uses unique technology to eliminate the use of fresh water and chemical compounds which cause harmful substances to be emitted into the environment. Warrens offers printing solutions from concept and design to prepress, finishing and bindery. Warren's environmentally responsible process also results in superior quality printing that is positioning Warren's as a designers' printer of choice.

www.warrenwaterless.com

Environmental Printing – More than Recycled Paper

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Warren's is Canada's leading environmental printer and is the first ISO 14001 certified printer in Canada. Fully committed to continuous improvement in waste reduction and pollution prevention, Warren's has a comprehensive Environment Management System (EMS) in place which integrates sound business practices with environmental, health, safety and quality control practices to reduce and/or eliminate negative impacts on the environment. In April 2004, the Canadian Council of Ministers of the Environment (CCME) recognized Warren's during its Annual Awards Program for its accomplishments and leadership in pollution prevention.

Warren's is a dynamic company that aspires to be different. Founded in 1972 by Larry Warren, it was originally in the prepress lithographic

film business operating with only five employees. It has since then evolved into Canada's leading environmental printer and has grown to employ approximately 20 workers. During the past decade when innovations in computer-based technology changed the industry, Larry Warren realized that this could make their business obsolete as it became more practical for printers to do the prepress production in-house. When he heard about waterless printing during a trade show in Chicago, Illinois in 1994, the idea instantly appealed to him because it was different - there were no waterless printers in Canada. The environmental benefits and superior quality of waterless printing convinced him to take advantage of the opportunity. Recognizing the trend for higher environmental standards in the business sector, he believed that choosing waterless printing would give Warren's a competitive advantage since there are few printers in Canada labeling themselves as environmentally friendly.

Sustainability Issues in the Printing Industry

There are a number of sustainability concerns in the printing industry. Printers use chemicals that can negatively affect air, water and land. Ingredients in solutions, cleaners, blanket washes, inks and coatings contain volatile organic compounds (VOC's) which are known to contribute to the depletion of the ozone layer linked to the global

warming phenomenon.ⁱ VOC's can also negatively affect human health by causing respiratory illnesses. Workers in the industry inhale organic solvents all throughout their shifts. The effects of occupational exposure to these substances can lead to damage to the liver, kidneys and lungs, degreasing of the skin and dermatitis, mild and reversible effects on the nervous system and more serious effects from considerable acute exposure. In addition, printers consume a considerable amount of fresh water which turns into hazardous wastewater when it is contaminated by toxic chemicals. The use of paper sourced from unsustainable forestry is also a key issue in the industry.

It takes 17 pulpwood trees to make one ton of paper, barely enough to supply daily newspaper to 20 people in one year.ⁱⁱ Although there are environmental alternatives such as recycled paper or FSC certified stock, not all printers offer them.

While some printers who print on recycled paper and use vegetable-based inks may call themselves environmentally friendly, the conventional printing is an inherently unsustainable process because of the reliance on fountain solutions and high amount of water consumption.ⁱⁱⁱ Therefore, conventional printing is limited by the technology being used and is inferior in terms of environmental performance in comparison to the waterless printing technology. Warren's use of waterless printing technology



WARREN'S
Naturally -Waterless Printing

eliminates many of the environmental issues related to conventional printing. Furthermore, its EMS system includes *all* aspects of the operations, from pre-press to the post-press stages.

Waterless Printing New Process Design

Waterless printing is an offset lithographic printing process which uses silicone-coated press plates eliminating the need for water in the printing process. Waterless plates have "ink receptive wells" instead of a flat, ink receptive surface. These wells act as supportive walls for the ink as it is transferred from the plate to the printing blanket through a press temperature control system. The finished plate has a non-image area made of ink repellent silicone. This design enables the plate to selectively attract and repel ink without using water and chemicals such as alcohol. Since silicone has a very low surface energy, it will resist ink if the ink's viscosity is such that it has a greater attraction for itself than it does for the silicone.^{iv} Normally, press temperature control systems are utilized for accurate control of temperature within the printing unit.

In conventional printing, ink is combined with water and isopropyl alcohol or other alcohol substitutes to dampen the metal plates and keep the non-image areas from attracting the ink. This fountain dampening solution results in the production of chemically-tainted waste water as well as the emission of harmful VOC's into the atmosphere. It is estimated that annually per shift, a conventional 40" press will utilize approximately 3,175 - 3,704 gallons of water while a 28" press utilizes around 2,646 - 3,174 gallons.

Better Printing Quality

Inconsistency in the ink/water balance in conventional printing can cause variability in color, streaking problems and longer drying period. Press operators must have a certain level of mechanical skill and chemical knowledge to control the complexity of the process. By eliminating the need for ink/water balance, waterless printing changes the complicated chemical process in conventional printing to a simple mechanical system which produces less variability and more accurate color reproduction.

The detail and clarity of a printed image is measured by lines per inch (LPI), called as the screen ruling, is determined by the number of dots that will fit in to one square inch. The more LPI, the clearer is the resulting image. The dampening solution affects printing quality because it dilutes the ink and causes the printed dots to soak and spread into the paper. Due to the increased dot gain, which is the inclination for dots to spread in size, conventional printing is limited to screen rulings of 200 lines per inch. This is reduced by up to 50% in waterless printing and thus, screen rulings of 300 lines per inch are common, while some waterless printers offer 400 or higher. As a result, print buyers can expect images with more clarity and depth.

Warren's EMS

While the company calls itself the leader in environmental printing, this statement comes with solid evidence, backed by their comprehensive EMS system which has led to various certifications and awards. Warren's believes that being environmentally-friendly means more than just printing on recycled paper. It is committed to comply with government standards as well as go beyond legislation and target minimal negative environmental impact.

There are some interesting aspects of Warren's EMS. Currently, Warren's

is eliminating the use of aluminum ink cans. An inherent problem with the use of these ink cans is the amount of ink residue left after usage which makes them unacceptable for recycling by most metal recycling companies. Thus, they are usually sent to landfills. Warren's uses inks supplied in cardboard tubes. Tubes are inserted into a caulking gun and compressed air pushes the ink. Empty tubes are simply recycled with paper waste. Additionally, they installed a blanket washing system which uses a paper fiber that comes into contact with the print blankets on the press. Not only does this system eliminate a significant amount of chemicals, the paper material can be used repeatedly and when expired, it is simply recycled along with the paper waste.

Leadership Vision

Clearly, Warren's is a company taking big initiatives in innovation and improving all aspects of environmental management. It is one in only 7 lithographic printers in Ontario (and one of 10 in Canada) certified by Canada's Environmental Choice Program, and one of the few printers in North America certified by the Forest Stewardship Council. Most recently, it adopted the direct-to-plate (also known as computer to plate) technology switching to a digital process that eliminates the use of



chemicals inherent in the film production process. These efforts have been achieved because of the strong leadership vision to include environmental values in the mission of the company. As a medium-size company, the driving force behind the company's values can be traced to the owner. Larry Warren has always been concerned about environmental issues and believes that companies should strive to keep our environment safe for future generations. He also believes that being environmentally friendly is not only a good idea but it is also good for business. While the company incurred around \$50,000 in registration and consulting fees for the ISO certification process, the cost savings from waste reduction and conservation, quality improvement and as well as the increase in demand for their products and services as a result of their values, proves the success of their vision. Larry exclaims, "I don't see our commitment to the environment as a business obstacle but as an opportunity for success. Our vision has allowed us to do good for the society and make money at the same time."⁴

Team Effort

Warren's attracts people who want to work for a company because of its vision. For instance, sales associate Brenda Rusnell who has had previous experience in conventional printing stated, "After years in the industry, the concept of an environmentally friendly process really caught my interest. It's very gratifying to be a part of a team that values the safety and preservation of the environment."⁵ She has been with the company for about a year and is fully trained in communicating to clients the environmental benefits and superior quality of waterless printing, as well as the environmental practices of the company.

While all employees are educated on the environmental policies and practices of the company, each person is given in-depth training on their specific tasks. Glenn Laycock, who has been with the company for 14 years, is responsible for managing the environmental aspects of the printing process including staff training. In the beginning when the company decided to implement an EMS system, he was chosen by Larry Warren to start a comprehensive

environmental plan. He looked at all aspects of the business operations, from prepress to bindery to identify all potential problems and provide solutions. By the time the company hired a consultant to formalize their EMS program for their ISO certification, there were barely any major additions. Glenn continues to be the force behind the successful implementation of the EMS program, and when the company was recognized by the CCME for its initiative in pollution prevention, he was sent to accept the award.

Clearly, the success of the company, especially in terms of environmental performance, is a team effort. Warren's dedication in creating a healthy and safe work environment for its workers, and in making a positive impact to the environment, gives everyone in the team the intrinsic motivation to achieve the goals of the company.

Strategic Partnerships and Eco-labeling

The increasing trend in corporate social responsibility and environmental awareness has led many companies to publish corporate environmental reports to show their initiatives in sustainability issues. Companies are now examining their entire supply chain as part of their overall sustainable strategy in response to increasing pressure towards transparency in business activities. Big companies like Ford and General Motors now require ISO 14000 certification from their suppliers. In the United States, Ford has chosen to partner with ImageMaster's, a waterless printing company dedicated to environmental performance, among other conventional printers, to print their Environmental Report.⁶ Strategic partnerships with big corporations like Ford can make a huge impact in the printing industry where most companies compete through pricing. Furthermore, partnerships can also be formed with the non-corporate sector. Warren's is chosen as a certified product supplier of WWF Canada and has done work for the Nature Conservancy of Canada as well as the Government of Canada. Indeed, environmentally-friendly printers such as Warren's can leverage themselves through their sustainable practices and the quality of their products and services, they

can gain a competitive edge against other printers in the industry which mostly compete through pricing.

Warren's has recently trademarked its slogan which states: "ENVIRONMENTAL PRINTING – IT'S MORE THAN RECYCLED PAPER." The idea of trade-marking the slogan came about when customers started requesting it to be printed on their materials in addition to its other logos (ISO, FSC, Ecologo^M, WPA). Eco-labeling allows Warren's clients to communicate their own commitment to the environment to their customers, making it a very effective strategy because their clients also benefit from it. Thus, Warren's is a testimony of how a business model integrating sustainability can produce a win-win situation by creating value for the various stakeholders in the company

Printing and Sustainability

A medium-size conventional printing facility with two 40-inch and one 28-inch press operating three shifts can utilize up to 27,000 – 32,000 gallons of water annually. (Waterless Printing Association)

The world's renewable water supply is constant. In the past century, the global population has tripled while water consumption has increased by six times. It is estimated that if per capita consumption of water continues at the current rate, human beings could be using more than 90% of available fresh water in 25 years, with only 10% left for other living things. By 2025, two-thirds of the global population will be living with severe water deficiencies or almost no water at all. (World Water Assessment Programme)

ⁱ Volatile organic compounds (VOC's) are pollutants which are precursors to the formation of ground level ozone (smog).

ⁱⁱ Waterless Printing Association

ⁱⁱⁱ Fountain solution: a mixture of water, volatile and non-volatile chemicals, and additives that maintains the quality of the printing plate and reduces the surface tension of the water so that it spreads easily across the printing plate surface.

^{iv} Viscosity: refers to the property of resistance to flow in a fluid or semifluid.

^v Larry Warren, in interview, May 28, 2004.

^{vi} Brenda Rusnell, in interview, May 28, 2004.

^{vii} Waterless Printing Association (WPA)