NEWS ADVISORY

New Research and Technology Developments Underscore Digital Printing's Environmental Advantages

Life cycle assessment, deinking analysis and recycling programs underline digital's environmental benefits

PALO ALTO, Calif., May 18, 2010 – Digital printing has received significant validation as a means to reduce printing's environmental impact compared to analog printing processes in two new, independently verified, ISO-compliant[1] life cycle assessment studies.

— Printing a brochure job on an HP Indigo 7000 Digital Press was shown to have a 30 percent lower potential carbon footprint than using a comparable sheetfed offset press at the economic break-even point of the two presses[2]

— Printing point-of-purchase signage work in run lengths up to 150 sheets – a quantity that represents 90 percent of signage printing jobs[3] – on an HP Scitex FB7500 UV curable ink large-format printer was demonstrated to have a lower potential carbon footprint than using a comparable screen printing system.

"Our customers fare better when they reduce waste, preserve resources and offer greater value," said Christopher Morgan, senior vice president, Graphics Solutions Business, HP. "HP is committed to helping our customers achieve those goals with efficient, productive solutions that refine print's important role in the communications landscape."

The new studies provide strong support for two key initiatives in the HP Graphics Solutions Business: reducing waste through print-on-demand production, and the greening of sign and display printing. Other advances supporting these initiatives include banner media that offer a reduced carbon footprint;[4] new environmental approvals for HP Latex Ink prints and select HP printing materials from organizations including AgBB, GREENGUARD and Oeko-Tex; expanded take-back and recycling initiatives; and progressive deinking research in both laboratory and real-world paper recycling environments.

Environmental benefits at the analog/digital economic break-even point

The recently completed life cycle assessment reports compare the various potential environmental impacts for print jobs undertaken on analog and digital printing solutions across the entire activity life cycle, including the press manufacture, the printing itself and end-of-life disposal of all of the elements involved.

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Specialist consultants conducted the HP-commissioned studies. A panel of independent experts also reviewed the studies, which were based on actual production runs using HP digital equipment and comparable analog print systems.

Following ISO 14040 and 14044 guidelines for studies aimed at making comparative assertions, the consultants measured and compared key factors including transportation, land use, raw material extraction, energy use, paper use, paper waste and recycling. The consultants' carbon footprint calculations came through the comparison of global warming data gathered using the University of Michigan's Risk and Impact Modeling group's Impact 2002+ life cycle impact assessment model.

The first assessment compared data for printing eight-page, letter size, double-sided color brochures on an HP Indigo 7000 Digital Press and a comparable sheetfed offset press from a major manufacturer. The study found that, in both cases, media production, power consumption and the consumables life cycle had by far the most significant potential environmental impacts, demonstrating that it is the use of the presses, rather than manufacture or disposal, that drives potential environmental impacts.

Detailed analysis for both jobs revealed that when printing a run of approximately 1,000 brochures, which represents the economic break-even point for the two presses, the potential carbon footprint per brochure printed is 30 percent lower when printed on the HP Indigo 7000 Digital Press than on the offset press. Most of digital printing's benefit resulted from the elimination of plate-making and start-up waste in the offset press run.

New solutions from HP have the potential to drive digital printing's benefits even further. For example, the new HP Indigo 7500 Digital Press reduces the amount of energy needed to print each page by up to 10 percent compared to the 7000 model. In addition, solutions like the HP T300 and the new HP T200 Color Inkjet Web presses substantially increase digital's break-even point with offset.

This means a broader range of direct mail, books and other documents can benefit from digital printing's inherent environmental advantages over analog printing, including lower start-up waste, on-demand printing of exact quantities as needed, and variable-data printing characteristics that can create output targeted to its target audience, increasing the usage of a printed piece and reducing waste.

HP's second life cycle assessment, conducted to address the large-format flatbed sign and display market, compares the carbon footprint of a job produced on a four-color analog screen printer and an HP Scitex FB7500 UV curable ink flatbed printer.

The assessment, which centered on printing 1.17 meter (46 inch) four-color point-of-purchase signs, indicated that even when using favorable assumptions for the screen printer, print jobs up to a quantity of 150 prints will have a lower potential carbon footprint when produced on the HP Scitex FB7500 instead of an analog screen printing system.

According to data from InfoTrends, approximately 90-percent of large-format print jobs are below 150 prints in length.[3] As with the offset and digital assessment,

screen printing's start-up processes and waste led it to having a larger potential carbon footprint for jobs below this run length.

Assessment data also indicate that if less favorable assumptions are used for the screen printer, the potential carbon footprint for the HP Scitex FB7500 would be lower than the screen printing system's for runs of more than 600 prints.

HP media, Latex Inks meet health-related environmental criteria

New developments with HP large-format media further demonstrate the opportunity to reduce printing's carbon footprint. HP HDPE Reinforced Banner media, one of seven HP recyclable media[5] compatible with HP large-format printers using HP Latex and UV-curable inks, is a180 g/m^2 (5.5-ounce) recyclable[4] alternative to polyvinyl chloride (PVC) scrim banner that provides the performance and strength of a 440 g/m^2 (13-ounce) PVC scrim with a carbon footprint that is up to two-thirds less.[4]

HP Latex Inks and select HP media have also recently passed tests to achieve key health-related environmental standards.

— Prints produced on HP PVC-free Wall Paper with HP Latex Inks provide odorless indoor wall decorations that meet AgBB criteria for health-related evaluation of VOC emissions of indoor building products[6] and the GREENGUARD Children & Schools standard.[7]

— HP Heavy Textile Banner, HP Light Textile Display Banner, and HP Wrinkle-free Flag with Liner for indoor display offer reassurance that material emission levels meet the Oeko-Tex Standard 100 criteria for products tested and certified from a human health perspective.[8]

— Three HP printing materials for graphics and technical printing applications – HP Bright White Inkjet Paper, HP Universal Coated Paper and HP Universal Heavyweight Coated Paper – are Forest Stewardship Council (FSC) certified[9] and carry the FSC Mixed Sources label, signifying that these media support the development of responsible forest management worldwide.

— The list of HP Indigo-certified third-party media also continues to grow quickly in terms of support for environmentally credentialed substrates. With more than 850 certified substrates that have at least one environmental credential, customers can choose from a wide range of media with an attractive environmental profile, including substrates certified by FSC, SFI, PEFC and ECF, certified carbon neutral media and recycled media.

Continued growth in recycling efforts

The HP Large-format Media take-back program for recyclable printing materials[4] – which provides free return and recycling of eligible media – is now part of the HP Planet Partners program. Six new media compatible with HP Designjet printers are being added to the program on June 1: HP Durable Banner with DuPont Tyvek, HP Clear Film, HP Matte Film, HP Premium Vivid Color Backlit Film, HP Matte Polypropylene and HP Everyday Matte Polypropylene. These six new media join five signage materials compatible with HP Designjet and HP Scitex Latex Ink printers already included in the take-back program.

Seven additional European countries have recently joined or are joining the HP Large-format Media take-back program. Austria, Denmark and Luxembourg have recently joined the program, while the Czech Republic, Finland, Poland and Portugal are scheduled to become program participants on June 1, bringing the total to 17 European countries. In North America, Canada is scheduled to join the United States in the take-back program next month.

In addition, the HP Planet Partners program has been expanded to support free consumables return and recycling efforts for HP inkjet printheads compatible with HP T300 and T200 Color Inkjet Web presses and HP Scitex LX Series printers. The printhead cleaning cartridge and printhead cleaning container for the HP Designjet L25500 Printer have been added to the program as well.

HP also implemented supplies take-back activities for HP Indigo customers in many parts of the world. Under the HP Indigo Binary Ink Developer (BID) take-back and parts re-use program, HP takes back BIDs at no cost to customers. HP receives more than 2,000 BIDs each month, which are then refurbished and reused.

Progressive deinking advances for the graphic arts industry

HP is showing continued success in research and real-world results related to deinking – the process for removing inks from printed substrates required in paper recycling operations. Today, HP is announcing our on-going digital print deinking collaborations with three major paper companies: AbitibiBowater Inc., NewPage Corp. and Stora Enso. The shared objectives of these collaborations are to generate fundamental insight into the role of ink, paper, and deinking process, as well as to conduct successful mill-scale trials using significant quantities of HP digital prints.

NewPage, which is North America's largest producer of recycled-content free sheet coated paper, successfully deinked a mix of HP Indigo prints and NewPage's standard mixed office waste furnish in an October 2009 pilot trial at Western Michigan University.

HP inkjet deinking research, conducted in independent test labs and within HP, continues to yield positive results. A range of papers tested with the HP T300 Color Inkjet Web Press show good deinkability in lab-scale tests, and HP has identified a class of common paper-making additives that appear to enhance pigment deinking. HP R&D has already identified ink modifications that further improve deinkability, and will work to incorporate these improvements in future generations of ink.

In addition, HP Labs, the company's central research arm, has continued progressing toward its goal of publishing a cost-effective, easy-to-implement process for paper mills that improves deinkability for a wide variety of print technologies. HP Labs intends to make this innovative process freely available to the paper industry.

For decades HP has been an environmental leader, driving company stewardship through product design, reuse and recycling as well as energy and resource efficiency. HP influences industry action by setting high environmental standards in its operations and supply chain, by providing practical solutions to make it easier for customers to reduce their climate impact and through its research on sustainability solutions that support a low-carbon economy. More information is

available at www.hp.com/earth.

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(1) Both of HP's new life cycle analysis studies conform to ISO standards 14040 and 14044.
(2) The economic break-even point is the quantity level when the approximate cost to print a job on a digital device and an analog device are the same.
(3) Comparable jobs between for digital and analog large-format applications based on industry average run lengths and economic break-even data in the April 2009 InfoTrends "Who Buys Large Format" study.
(4) Calculation by the HP IPG Environmental Technology Platform Team (and confirmed by an independent environmental life cycle assessment firm), based on the activities associated with the manufacturing of the product, and comparing 180 g/m^2 (5.5-ounce) HP HDPE Reinforced Banner to 440 g/m^2 (13-ounce) HP Outdoor Frontlit Scrim Banner using the Swiss Center for Life Cycle Inventories Ecoinvent 2.0 database and model IPCC 2007 version 1.01; primarily for the category of PVC/PET/HDPE, and measuring materials extraction, transportation to the manufacturing site, and greenhouse gas emissions generated during manufacturing. Lower carbon footprint for HP HDPE Reinforced Banner is not completely attributable to its weight compared to 440 g/m^2 PVC scrim, nor is it dependent on type of printing method used on the banner itself.
(5) HP offers the HP Large-format Media take-back program in the United States, Europe and Canada (as of June 1, 2010), through which most HP recyclable signage media can be returned; availability varies. Some recyclable papers can be recycled through commonly available recycling programs. For details visit www.hp.com/recycle. Aside from this program, recycling opportunities for these products are currently only available in limited areas. Customers should consult local recycling resources for recycling these products.
(6) The Committee for Health-related Evaluation of Building Products, AgBB, establishes the fundamentals for a uniform and reproducible health-related evaluation of building products in Germany, including criteria for testing and an evaluation scheme for health-related evaluation of VOC emissions from building products used for application indoors.
(7) HP PVC-free Wall Paper printed using HP Latex Inks is listed in the GREENGUARD product listing for low emitting products and is tested to the GREENGUARD Children & Schools standard. The print is neither GREENGUARD nor GREENGUARD Children & Schools Certified. The GREENGUARD Environmental Institute is an American National Standards Institute (ANSI) authorized standards developer that establishes acceptable indoor air standards for indoor products, environments, and buildings. See www.greenguard.org.
(8) Unprinted HP Heavy Textile Banner, HP Light Textile Display Banner and HP Wrinkle-free Flag with Liner are Oeko-Tex certified according to Oeko-Tex Standard 100, which is a globally uniform testing and certification system for textile raw materials, intermediate, and end products at all stages of production. Tested for emissions of chemicals such as pesticides, allergy-inducing dyestuffs, or tin-organic compounds.
(9) Trademark license code FSC-C017543.

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