

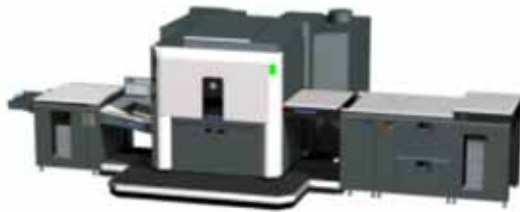


Reducing the environmental impact of print with digital on-demand technology

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HP digital on-demand printing solutions

HP INDIGO DIGITAL PRESSES



HP INKJET WEB PRESSES



HP SCITEX DIGITAL PRESSES



Alternative to:

offset

screen

flexo

Key applications:

Commercial printing

Photo

Publishing

Direct mail

Labels & packaging

Transpromo

Sign & display



HP is recognized for environmental leadership



HP ranked first among technology companies and placed fifth overall among listing of Best Global Brands

HP listed in top of rankings from 2009-2011. In 2011, HP kept the #2 spot on the US 500 list, and is one of three technology companies in the top 15 of the Global 500.



HP named in top 20 green companies in Brazil by Época Empresa Verde for 2011



HP has been on the FTSE4Good Index since 2003



HP ranked #2 in the 2010 Climate Counts Company Scorecard

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HP listed on the Carbon Disclosure Project's S&P 500 Carbon Disclosure Leadership Index



HP Trade Data Center in Wynyard won 2010 Green Enterprise IT Award



HP ranked #2 on the 2011 Top Green-IT Vendors



HP listed on DJSI North American Index



HP ranked #1 in the Ranking on Conflict Minerals for our efforts/position on conflict minerals

China Low Carbon Champion

People.com.cn, one of the most influential government websites in China, recognized HP China as the China Low Carbon Champion for 2010



HP ranked #1 in the 17th Greenpeace Guide to Greener Electronics (2011)



HP ranked #15 on Top 25 Supply Chain for 2010



HP China named to "50 Green Companies 2010" by *Business Watch* magazine



HP won the Environmental Printing Award from *PrintAction* for the past five years (2006–10)



HP was recognized as a Business and Policy honoree for making sustainability an integral part of our business operations in 2010



HP received Carbon Trust Standard 2010



November 2011

What we'll cover

How digital on-demand printing can help to reduce environmental impact

Book printing example

Implications for other parts of the printing industry

Environmental dimension of new HP product announcements

Deinking update

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Digital on-demand: reduce waste, cost and environmental impact of printing



ECONOMICS that allow cost effective short runs – print what you need, when and where you need it

Variable data printing for more **CUSTOMIZED** and **TARGETED** content, allowing the same result to be achieved with less printed material

Drastically reduced printing process **WASTE** - no plates, no make-ready

Reduced print **TRANSPORTATION** from printing less and the potential to print closer to end user

Digital printing environmental benefits recognized by the California State Government, amongst others

Digital Printing

High-speed digital printing is an excellent alternative to traditional lithographic printing. Digital printing produces a high-quality copy on the very first page, thus eliminating paper waste. Lithographic presses have a higher amount of waste paper and chemical usage as the printed press page is brought up to a usable quality. Lithographic printing is more affordable when printing large quantities of materials.

...
Digital printing is also beneficial in giving on-demand publishing opportunities. On-demand printing eliminates the need to store and inventory larger quantities of printed forms, brochures, directories and publications. Additional quantities can be produced "on-demand" when needed.

...
Digital printing also may provide for regional distributed printing, thereby saving shipping costs and reducing the demand for packaging materials.



“ABOUT 30% OF
BOOKS IN AMERICA
ARE RETURNED TO
THE PUBLISHER
UNREAD”



The Economist. February 27th 2010, “Just Press Print.” 2 p. [online]

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THE BOOK INDUSTRY ENVIRONMENTAL COUNCIL HAS SET A GOAL OF REDUCING THE U.S. BOOK INDUSTRY'S GREENHOUSE GAS EMISSIONS BY **20% BY 2020** AND BY 80% BY 2050 (BASED ON A 2006 BASELINE).



Book Industry Environmental Council,
Press Release April 16, 2009,
www.bookcouncil.org/press_release.html

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Book return rates lower for books printed on digital presses

RETURN RATES FOR BOOK PRINTING – values and sources		
Value	Citation	Source
Offset book printing		
35% for best sellers	"In addition, there is a return link for unsold copies as roughly 35% of best sellers are unsold" (US)	(Matthews et al., 2002)
25%	Figure given in "TABLE II Carbon Footprint and Key Figures, 2006" (US)	(Borealis Centre for Environment and Trade Research, 2008) (p.8)
25%	Average value for paperback (hardback = 30%) (US)	(Publisher, 2010)
30% average	"About 30% of books in America are returned to the publisher"	(The Economist, 2010)
up to 30% and more	"In recent years, many publisher have experienced returns of 30% or more" (World)	(Book Industry Study Group, 2010) (p.34)
21%	Pulped portion only, not including resold as used books. Refer to hard cover and paperback books.	Based on data from a major educational book publisher, weighted averages for 2007 - 2009 (contact in 2010)
23.8%	The 2009 figures are respectively for Adult trade paperback, Juvenile trade paperback and University press paperbacks.	(Greco, 2011)
17.8%		
23.5%		
Digital book printing		
less than 5%		Based on data from a major educational book publisher, weighted averages for 2007 - 2009 (contact in 2010), HP Experts
lower than offset	"As demand for titles and the actual production of books can be more closely matched, fewer books will be returned to publishers"	(Book Industry Study Group, 2010) (p.37)
lower than offset	"USR program produces small amount of inventory to cover a few month's sales, this reducing the risk of obsolescence" (USR = ultra short run)	(Book Industry Study Group, 2010) (p.40)

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HP commissioned an environmental study

Based on widely accepted Life Cycle Assessment (LCA) technique for identifying environmental impacts in complex systems

- Allows comparison of similar products, services or systems throughout their lifespan
- Considers production, distribution, use and end of life

Compared the life cycle environmental impacts of using HP digital inkjet presses to either supplement or replace printing of paperback books on an offset press

- For 'best seller' and 'classic book' demand profiles



Study conducted in accordance with ISO 14040 standard

LCA conducted by Canadian environmental assessment consultancy Quantis

Book printing impact calculations based on primary test data

Data sourced from

- HP
- Independent offset press expert
- Leading organizations in the book industry
- A range other sources



Study reviewed by a panel of independent experts

Scenarios were limited to use of one or more of these four presses

CONVENTIONAL OFFSET PRESS



Timson Offset T48a ZMR

DIGITAL PRODUCTION PRESSES



HP T200 Inkjet Web Press

HP T300 Inkjet Web Press

IN-STORE PRINT ON-DEMAND DIGITAL PRESS

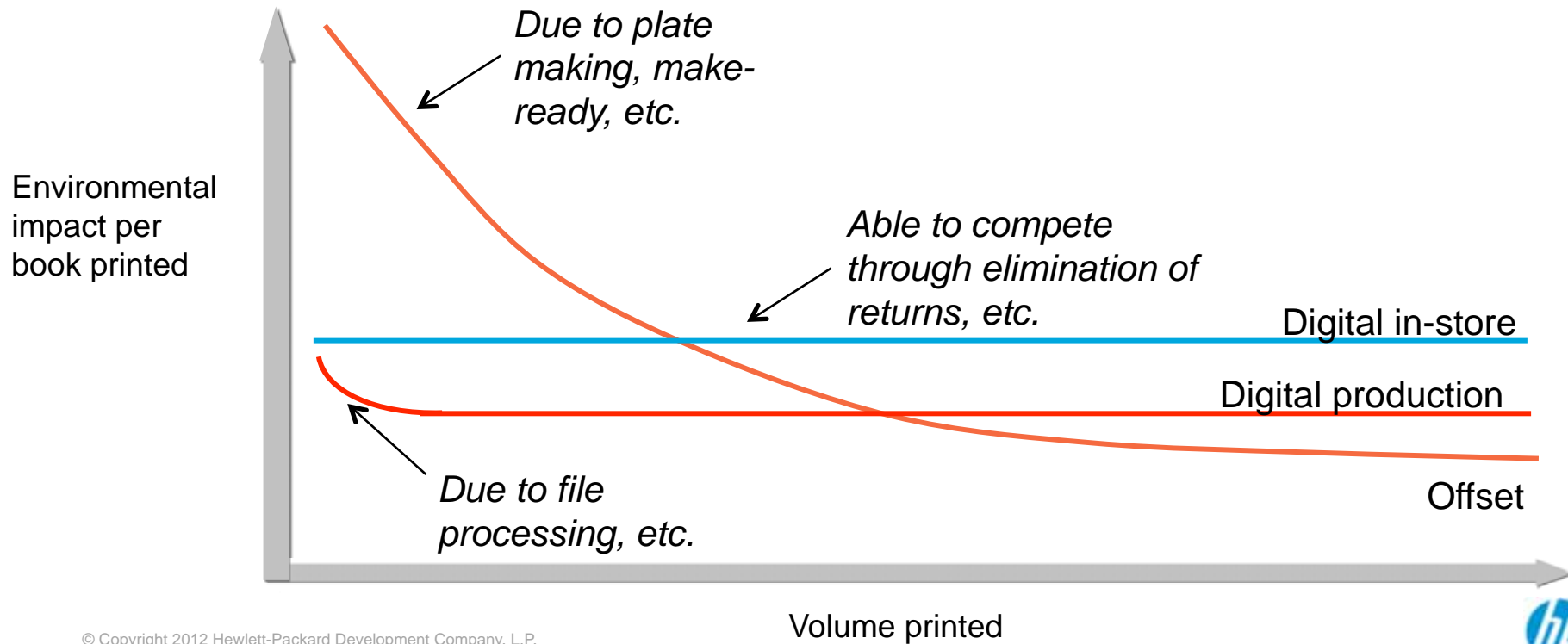


HP R85 Inkjet Press



A word about the environmental profile of analog and digital presses

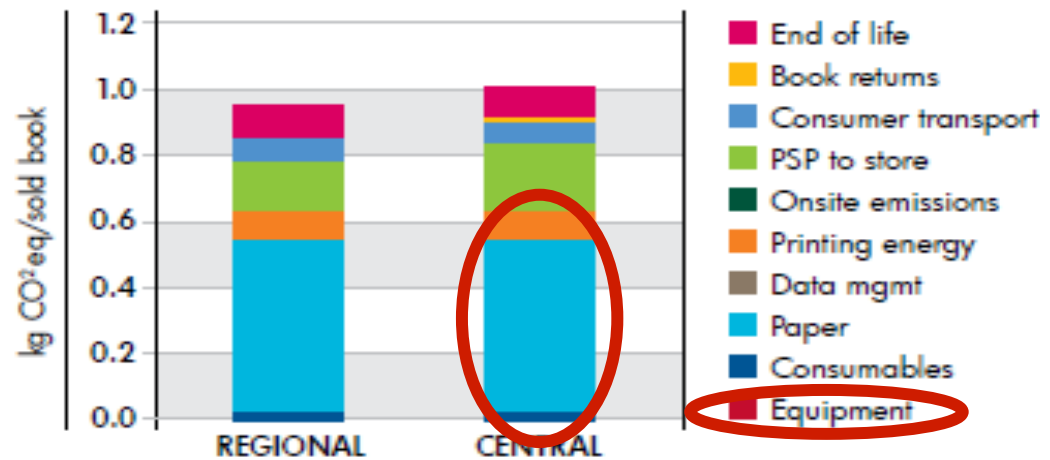
Ignores returns!



Paper represents 40 – 80% of total potential environmental impact

Sample results from printing on the Digital T300

Climate change impacts for Digital T300 press system illustrating that paper is the largest potential impact (Note that waste paper from returned books is included in the Paper component and not under book returns.)

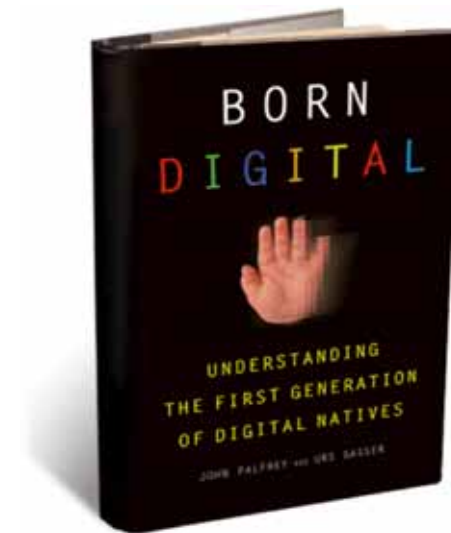



To the extent possible, the books printed were identical on each of the presses compared

The “function” was to print, bind, distribute and sell paperback books to retail store customers in the US and to dispose of them

The paperback book was 5.5”x 8.5”, 240 pages, double-sided, with black text at 5% ink coverage. The soft book cover was four color with 60% total ink coverage

Uncoated, wood-free paper was used for all covers. For the book block, coated, wood-free paper was used for the R85 system and uncoated wood-free paper was used for the other three presses





Scenarios analyzed were based on fulfilling one of two demand profiles

BEST SELLER
500,000 books
over two years

CLASSIC BOOK
5,000 books
over five years

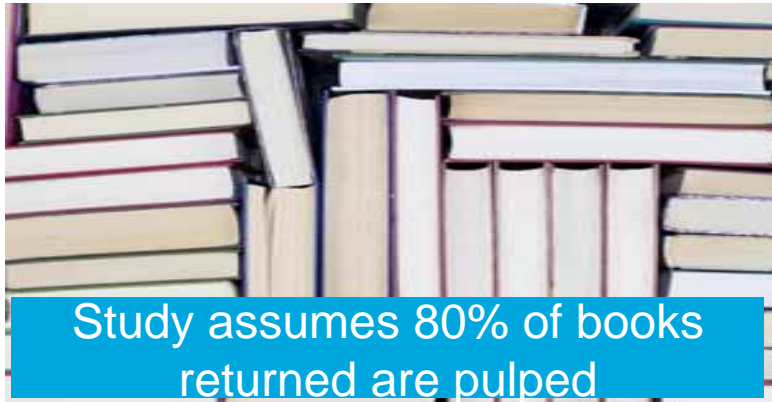


Book printing modeled in various scenarios

Offset only
Mixed
Digital only

BEST SELLER

- A. All the books printed at once with the Timson Offset, at one central location.
- B. 400,000 books printed with the Timson Offset at one central location. A second run of 50,000 with offset, and the remaining demand fulfilled with short runs (i.e. 1,000 books) on the Digital T200.



CLASSIC BOOK

- C. All the books printed at once on the Timson Offset at a central location.
- D. An initial run of 2,000 books printed with the Digital T300 press at a central location and then short runs are produced over the remaining 5 years (same press, same location) to maintain the bookstore shelf stock, i.e. print-to-stock.
- E. Three initial runs of 700 copies each are printed on the Digital T200 press at three regional locations and then very short runs are produced over the remaining 5 years to maintain stock (same presses, same locations).
- F. An initial run of 1,000 copies is printed on the Digital T300 press at one central location and the rest is printed on demand on the Digital R85 press at retail bookstores.



All potential environmental impacts measured are summarized in four 'endpoint' categories

Endpoint category	Unit of measure
Human health	Disability Adjusted Life Year (DALY)
Ecosystem quality	pdf* m ² * year
Resources	MJ Primary
Climate change	Kg CO ₂ equivalent



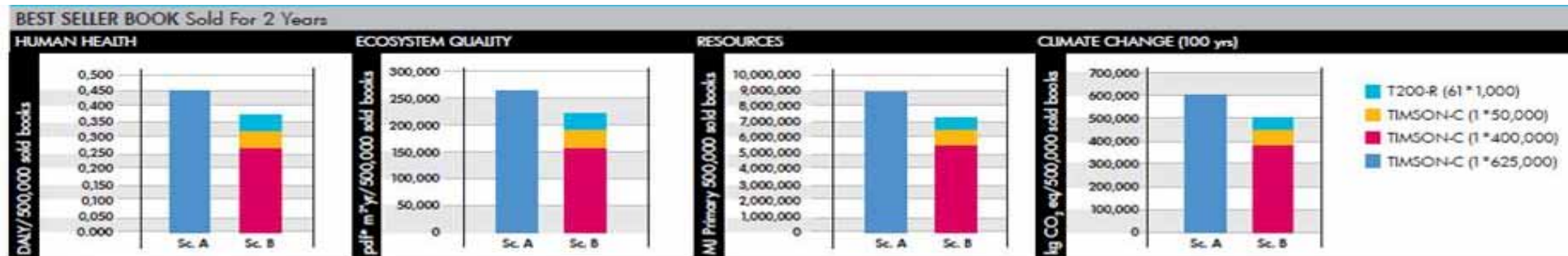
Potential environmental impacts for best seller scenarios

Scenario B requires 22% less books to be printed than the offset only Scenario A

17-20% potentially lower environmental footprint than offset only

In climate change terms, equivalent to

- 234 barrels of oil saved
- 19 car annual emissions avoided



Potential environmental impacts for classic book scenarios

14-34% potentially lower environmental footprint than offset

In climate change terms, equivalent to

- 2.8 barrels of oil saved
- 0.25 car annual emissions avoided



In all scenarios evaluated, supplementing or replacing offset printing with HP digital inkjet technology lowered the potential environmental footprint of producing and selling paperback books significantly

Carbon footprint alone reduced by 14 to 20%

Highest potential reductions observed for Scenario D

- T300 press in combination with an R85 press, used to print classic book in place of the Timson offset press

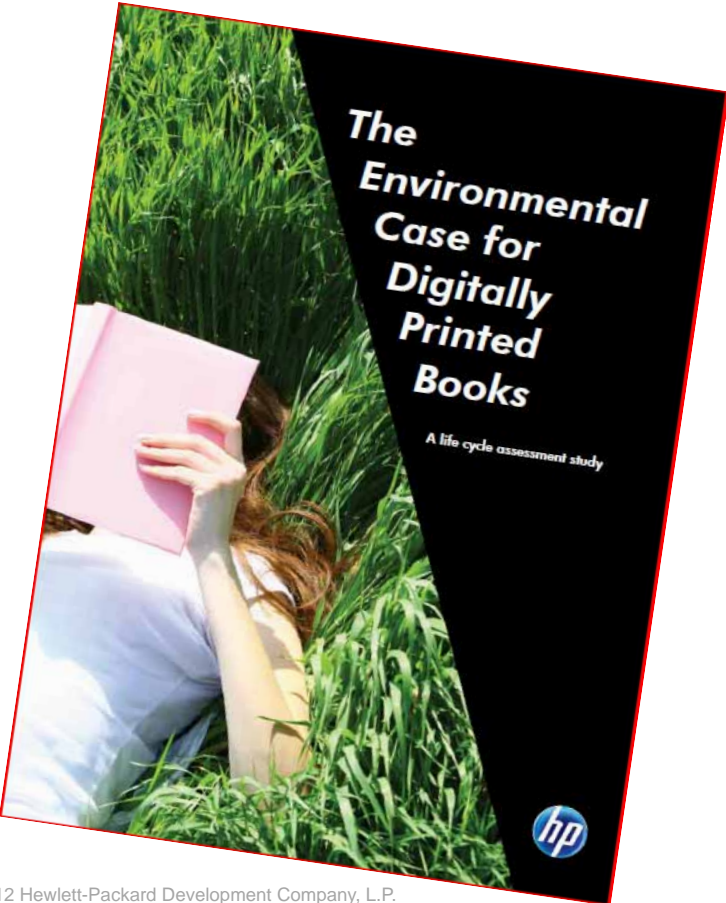


Key factors include

- **Print run length**, a bigger issue for offset due to 'make ready' waste
- **Transportation distances**, with regional and local distribution resulting in lower potential impacts
- **Data management** for the point-of-purchase (POP) digital press



Printed copies of the study available



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Evidence to suggest significant levels of redundant prints across the industry

Photos



Sign & Display



Anecdotal evidence collected in the course of Infotrends research suggest high levels of POS signage waste

Direct Mail



Marketing Collateral



PODi has estimated that 30% of marketing collateral printed is never used

Labels & Packaging



My conversations with major packaged goods companies suggest high levels of waste

Publishing



30% of the books printed in the US are returned to the publisher unused

Case study - PureprintGroup Sussex, England

Pureprint + sustainability

Pureprint has also won a Queen's Award for Enterprise: Sustainable Development; Carbon Neutral certification, and it has developed its own Pureprint® protocol that comprises more than a hundred environmental initiatives.

Pureprint is operating a variety of web-to-print (W2P) solutions, linked to its two HP Indigo 7500 Digital Presses, installed in 2010.



Strategies

University of Portsmouth wanted to streamline its postgraduate prospectus. Traditionally, some 20,000 copies were printed every two years, stored and sent out when requested.

Postgraduate students have a clear idea of the course they want to follow and don't need to see all the options.

Working with Pureprint, the University's communications team devised a W2P concept where potential graduate students could request a prospectus from the University's website and select the elements to be included.

Results

Apart from providing an immediate response with personalized information, the University has benefitted from a reduction in the number of printed pages, wasted copies, postal charges and storage costs.

With digital printing, they can print 'on-demand' and dramatically reduce or eliminate stock that needs to be warehoused.



HP digital presses can help reduce the environmental impact of transpromo printing

HP digital printing solutions can print transpromo materials in one shot – no shells required



Environmental impacts of shell printing eliminated – notably the printing energy required

No waste due to shells held in stock becoming obsolescent before they can be used – perhaps due to changes of logo or format

Variable data printing capabilities also enable content to be better tailored, meaning that fewer pages can be required to convey information that is better targeted to the recipient

HP Indigo 10000 Digital Press

Everything you expect from an Indigo, in a larger format



B2 – 75x53 cm / 29.5x20.9 inches

7 colors

Automatic duplexing

Multi-source feeder

2.57 x image area over SRA3

Imposition efficiency as much as 4x

Broad media range



HP Indigo 10000 Digital Press

Designed with the environment in mind from the outset

Impacts considered across the complete life cycle



Innovative environmental features in the areas of:

- Consumables waste reduction
- Consumables design for recyclability
- Imaging Oil recycling
- Energy management and recovery
- Maximizing the proportion of sellable prints



HP Indigo Oil recycling technology

The improved on-press oil recycling system of the HP Indigo 7600, WS6600, W7250 and 10000 Digital Presses is designed to eliminate the need for additional imaging oil

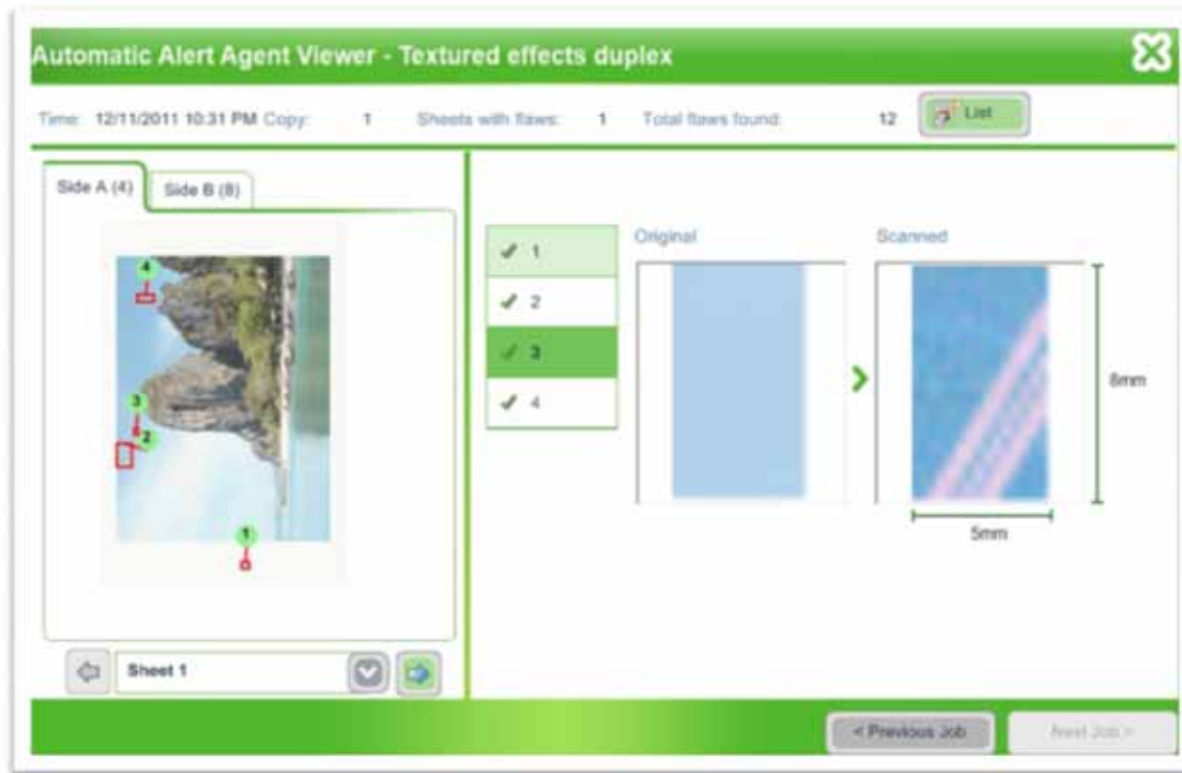


How it works:

- Liquid electrophotographic printing uses a mineral oil as a liquid carrier
- During the printing process, oil is separated from the image by evaporation. The blower draws the vapor and ambient air into the cooler. The ambient air contains water vapor
- The cooler unit condenses the oil and water vapor into a liquid mixture of oil and water
- The oil recycling system separates the oil from the water. The oil is pumped into the imaging oil tank and combined with ink additives (if needed). The recycled oil is then fed back into the press and is ready for use in the printing process as well as maintenance operations
- Water generated during the separation process is clean enough to qualify for disposal in municipal drainage systems

Intelligent Automation with Automatic Alert Agent

NEW



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Extending the HP Indigo 10000 Platform



HP Indigo 10000
Commercial Printing,
Photo and Publishing



HP Indigo 20000
Flexible Packaging
and Labels



HP Indigo 30000
Folding Cartons



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Full HP Indigo consumables take-back and recycling programs to be offered in Germany from the beginning of May 2012



HP Indigo in cartridge recycling program

Imaging Oil take-back program

Binary Ink Developer take-back and parts re-use program



Free and convenient for customers



Green Leaf Labels

Three HP Indigo presses (5600, WS6600 and 7600) have been awarded Intertek Green Leaf labels



Provides rigorous independent verification of environmental claims that we make for the presses

HP Indigo 7600 Digital Press - Independently Verified for Environmental Credentials

- HP ElectroInk is not classified as harmful to environment and health and does not contain substances of specific concern, heavy metals or aromatic amines.¹
- 1100 media with environmental sustainability certifications have been qualified for use on the press and are identified to customers.²
- Advanced on-press oil recycling system; designed to eliminate the need for Imaging Oil for printing and maintenance.³
- Liquid Electrophotographic (LEP) digital printing process; eliminates the use of many hazardous substances typically used in offset printing while producing print that maintains the look and feel of offset.⁴
- Ink cartridge recycling program and Binary Ink Developer take-back and parts reuse program; ensure environmentally sound recovery and/or treatment of used consumables.⁵

Learn more about this product, environmental verification, and applicable exemptions by visiting:

www.intertek.com/green/certification

Certification No: 1208910 / 1208911 / 1208912 / 1208913 / 1208914



1. HP ElectroInk is not classified as hazardous to the environment or as hazardous to health according to EU Directive 1999/45/EC.
2. The HP Indigo media locator tool identifies media with sustainability certifications that have been approved for use with the press. Media availability varies by region – not all media are available in all regions.
3. Based on average coverage of 15% per separation and average maintenance practice.
4. Eliminates the need for plate-making and dampening (or fountain) cleaning chemicals. Removing these processes eliminates the use of many chemicals defined as hazardous under the European Union’s CLP regulation.
5. Program features and availability vary. Program may not be available in your locality.



HP Indigo has initiated a program to offset the carbon emissions associated with the manufacture of its Series III presses



Applies initially to HP Indigo 7600, WS7250 and WS6600 digital presses

Carbon footprint of press manufacture will be derived from figures provided to the Israeli government under its corporate green house gas emissions reporting program

Offsetting undertaken by purchasing carbon offsets through the Good Energy Initiative¹ to support their work in projects in the community that reduce green house gas emissions

1. Visit www.goodenergy.org.il/En/Home for more information



Print deinkability and recyclability

Proportion of digital prints will be low, even in next few years

Prints from ***all*** production inkjet presses to represent just 0.3% of recovered paper stream even in 2015¹

But work now on digital print deinkability and recyclability will ensure smooth transition in 5-10 year timeframe

- As digital prints come to represent a more significant proportion of the total

Goal: Ensure HP digital prints can continue to be placed in normal recycling collection bins.



Print deinkability and recyclability

HP Inkjet Web Press prints



Broad collaboration with industry ensures practical solutions

- With major deinking paper companies around world, including Stora Enso & UPM
- Digital Print Deinking Alliance (DPDA): HP, Kodak, Océ, Ricoh Infoprint
- DPDA and INGEDE: inkjet deinking research collaboration

INGEDE Method 11 results from independent test labs and paper companies

- 'Good Deinkability' score on over 15 papers with 2011 HP Inkjet Web Press ink – new generation ink appears even better
- 6 samples score over 90 – comparable to best offset deinkability
- Paper design also important – HP-funded research publishing mechanisms and solutions to benefit all



Print deinkability and recyclability

HP Indigo Electrolnk prints

Successful mill trial with 5% HP Electrolnk prints conducted at Arjowiggins Greenfield, France deinking mill in November 2011

- HP Indigo prints were made on a variety of coated and uncoated wood-free papers, with a representative range of ink density, including high-coverage photo prints
- “The mill trial, using standard Greenfield Mill process conditions, achieved saleable high quality de-inked pulp suitable for coated or uncoated paper production.”¹
- “Mill process efficiencies were unaffected.”¹

“Two loop lab deinking studies conducted at PMV Darmstadt, designed to simulate wood-free deinking mills, demonstrate the deinkability of HP Electrolnk prints”²

Each month approximately 80 tons of prints produced with HP Electrolnk in HP Indigo facilities are collected and sold for a variety of recycling applications

1. Quotes from Laurent Benault, Mill Manager, Arjowiggins Greenfield
2. Quote from Dr.-Ing. Hans-Joachim Putz, Fachgebiet Papierfabrikation und Mechanische Verfahrenstechnik (PMV), TU Darmstadt

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What we covered

How digital on-demand printing can help to reduce environmental impact

Book printing example

Implications for other parts of the printing industry

Environmental dimension of new HP product announcements

Deinking update



Be part of the ECO LEADERSHIP FORUM @drupa

Sustainability leaders will discuss how the printing industry can move forward on key environmental issues in two sessions. Come and hear what the experts have to say – and participate in the discussion!

Saturday 5th May, 15:45 – Sharing sustainability knowledge across the supply chain

Tuesday 8th May, 15:45 - Improving environmental performance

Venue: The HP tent, just outside of Hall 4, close to the HP stand

SIGN-UP for the event at hp.com/go/ecoleadershipforum

Moderator:

Stephen Goddard,
HP



Panelists:

Laurel Brunner,
Verdigris



Frazer Chesterman,
Eco Print



Marci Kinter,
Sustainable Green
Printing Partnership



Guest PSP panelists:

Matthias Hausmann,
CEWE Color



Richard Owers,
Pureprint

PureprintGroup





Headline partner for...

EcoPrint
EUROPE: BERLIN
26/27 Sept 2012



Thank you

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