

# HP Indigo ElectroInk

Frequently Asked Questions





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## What is HP Indigo ElectroInk?

HP Indigo ElectroInk is a unique liquid ink that combines the advantages of electronic printing with the qualities of liquid ink. ElectroInk contains charged pigmented particles in a liquid carrier. Like other digital printing technologies, e.g. Xerography, ElectroInk enables digital printing by electrically controlling the location of the print particles. However, unlike Xerography, ElectroInk enables very small particle size, down to 1-2 microns. By comparison, inkjet technology, while laying a thin layer of ink on the media, suffers from the inherent inaccuracy of the ink jetting.

ElectroInk is supplied as a concentrated paste that is loaded into the press in tubular cartridges in a “clean hands” operation. Inside the press it is automatically fed into ink supply tanks and diluted with oil, to form a fluid mixture of carrier liquid and colorant particles ready for printing.

To summarize, ElectroInk enables high quality, wide and accurate color gamut, sharp images, and color with gloss closely matching the media, similar to and at times surpassing conventional offset printing, and exceeding the quality achieved by competing digital printing technologies.

## How does HP Indigo ElectroInk deliver high-quality digital printing?

The small particle size in the liquid carrier enables high resolution, uniform gloss, sharp image edges, and very thin image layers that closely follow the surface topography of the paper. This gives a highly uniform finish, complementing the paper and resulting in a similar texture both on the image and on the non-image areas.



## What is the longevity of photos printed with HP Indigo ElectroInk?

More than 75% of photobooks worldwide are printed today using ElectroInk on HP Indigo's high-quality presses. To confirm the longevity of papers printed with ElectroInk, the prints were submitted for testing to an independent print permanence institute, Wilhelm Imaging Research (WIR). \* The results verify the permanence of HP Indigo prints on display for up to 54 years before any noticeable signs of fading or changes in color balance, ahead of the top silver halide paper Fujicolor Crystal Archive, and much longer than standard silver halide papers. HP Indigo photobooks received an album/dark storage rating of greater than 200 years, compared with a maximum rating of more than 100 years for silver halide solutions. HP Indigo is the only digital press manufacturer that has published print permanence results from independent, third-party testing.



## What is the color consistency of HP Indigo ElectroInk?

HP Indigo presses are the only color digital production presses that have achieved GRACoL \*\* certification for proofing. This was reached with both CGS and GMG color management tools. This certification requires tight tolerances. Using the same color management tools, HP Indigo also achieved Fogra print validation certification with very high scores.

As stated in the Seybold Report, \*\*\* the color consistency obtained on the HP Indigo press could have come from an offset press.

HP Indigo color performance leadership was also demonstrated in IPA testing of 10 digital presses from leading manufacturers. The tests found the HP Indigo 7000 Digital Press as having the lowest differentiations in color variation within a run and from day to day, and the closest matching of spot colors.

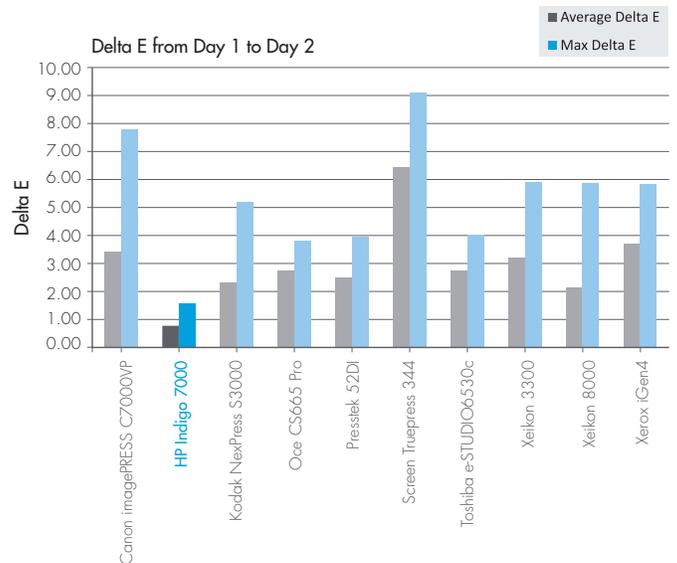
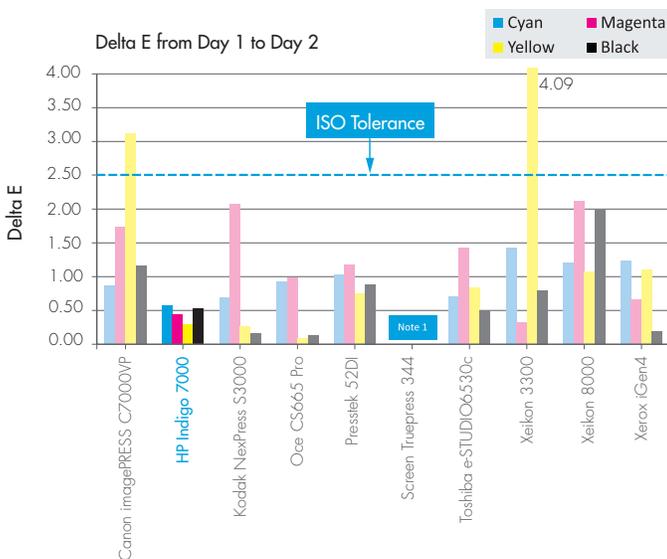
\* WIR study published on March 7, 2011.

\*\* General Requirements and Applications for Commercial Offset Lithography (GRACoL) certification 2009

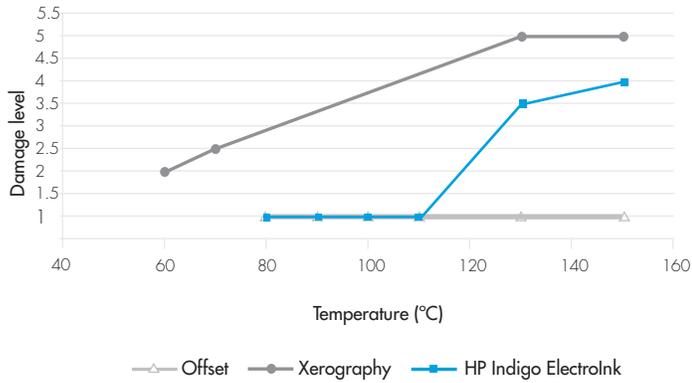
\*\*\* The Seybold Report; Vol.5, No.7; 2005



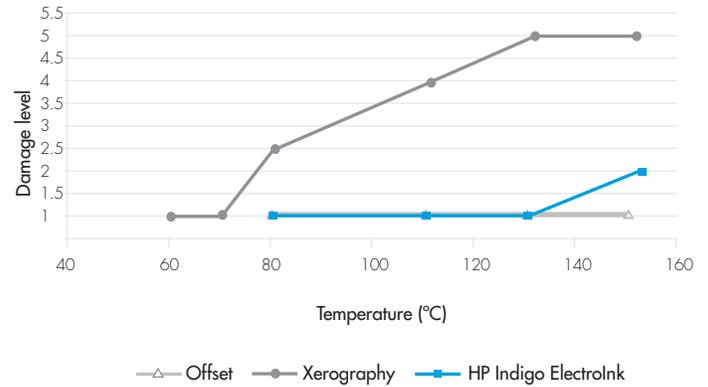
IPA testing of 10 leading vendor presses. The HP Indigo 7000 Digital Press achieved the lowest differentiation in Delta E and the closest matching to the PANTONE GoeGuide™.



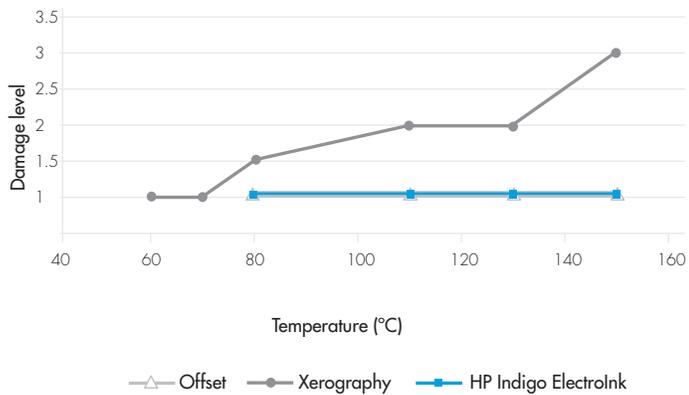
Heat resistance  
SBR Coated Gloss 1 hour



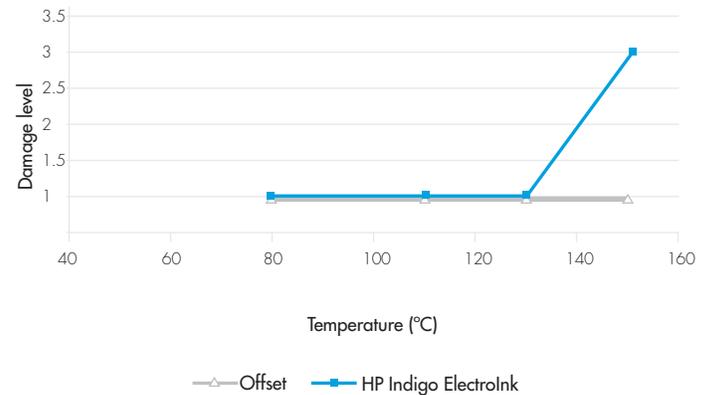
Heat resistance  
SBR Coated Matte 1 hour



Uncoated 1 hour



Acrylic Coated Gloss 1 hour



## How resistant to heat are HP Indigo ElectroInk prints?\*

The test for heat resistance measures the visible changes to print quality when two facing sheets, positioned so that the ink on one comes into contact with the ink on the other, are exposed to increasing temperatures (ranging from 140-300°F) under a steady pressure of 645 Pascal. The prints were tested after one hour of exposure. The test is a qualitative analysis based on the examiner's visual evaluation of the degree of damage ranging on a scale from "no damage" to "strong damage". The tests were executed using ElectroInk technology, Xerography technology (Dry EP) and offset inks on various types of paper, intended to simulate a variety of typical substrates.

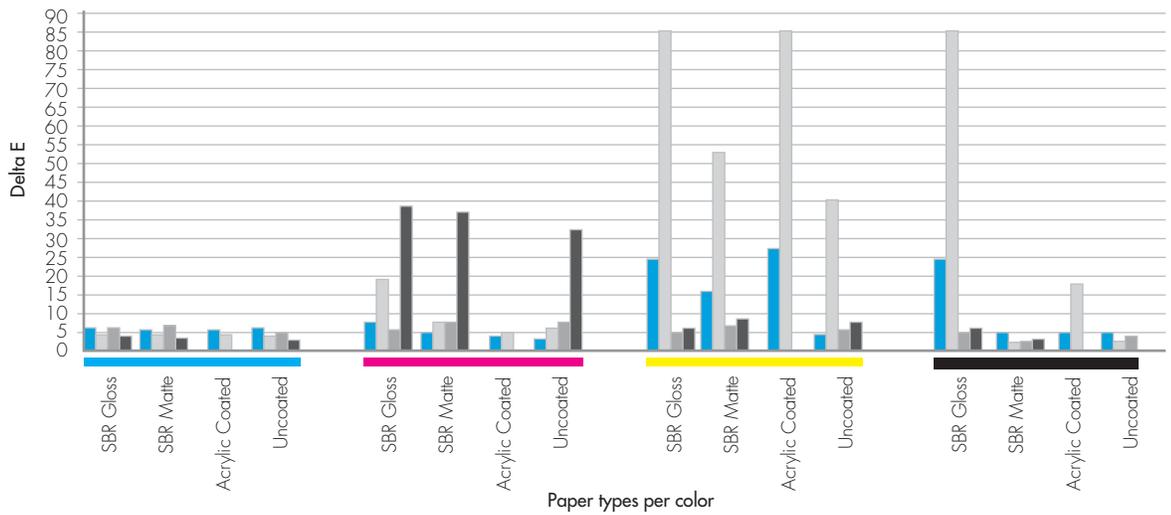
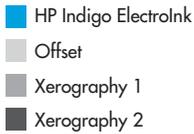
\* Heat resistance: The ability of materials to withstand excessive heat which may result in the lowering of flexibility, strength, and resistance to natural decay through loss of moisture, as well as acceleration of decomposition reactions.

## What is the lightfastness of prints produced with HP Indigo ElectroInk?

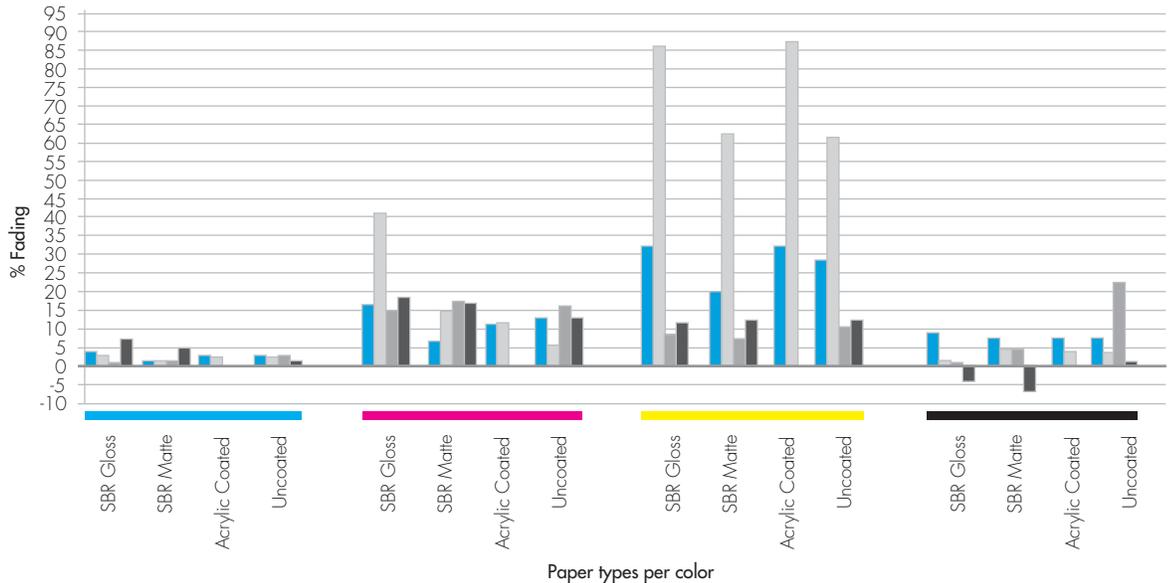
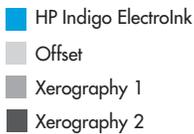
HP Indigo ElectroInk's ability to withstand exposure to light is measured by utilizing various tests for lightfastness. Lightfastness is a term used to describe the resistance of a material to color change when exposed to sunlight or to artificial light sources. Lightfastness tests evaluate the print's resistance to ultraviolet light by comparing the measure of change that has occurred between an exposed area and an unexposed area. A xenon arc lamp is used in these tests for fade and color change testing of inks and media. A lightfastness test was performed according to a procedure specified by Wilhelm Imaging Research ([www.wilhelm-research.com](http://www.wilhelm-research.com)) by exposing test samples under an Atlas Suntest Tabletop Xenon Exposure System, for three-day cycles while monitoring changes in optical density (percentage of fading) and color coordinates (deltaE). Each three-day cycle simulates six years of exposure under the above conditions. Three cycles of six days each, simulates 18 years. The tests were executed using HP Indigo ElectroInk technology, Xerography technology (Dry EP) and offset inks on various types of paper, intended to simulate a variety of typical substrates. A test of lightfastness is shown on the following page. The results show changes to color coordinates (measured by the variation in deltaE) and changes in optical density (determined by the percentage of noticeable fading).

### Lightfastness test results

Change in color coordinates at 6 days' exposure



Change in optical density at 6 days' exposure



## What kinds of substrates can be used with HP Indigo ElectroInk?

HP Indigo ElectroInk can be used on more than 3500 approved media available worldwide. The HP Indigo family of presses prints on the industry's widest range of substrates for high-end digital color printing—from standard papers, to transparencies, labels, and plastic stocks.

HP Indigo works with media partners around the world to optimize and qualify a wide range of substrates.

At the Rochester Institute of Technology and the HP Indigo Singapore certification center, HP Indigo offers a commercial/specialty Media Certification Programme that enables substrate manufacturers and HP Indigo digital press owners to evaluate substrate compatibility with HP Indigo digital presses.

The qualification procedure for substrates comprises two parts. The first is a screening test to check fundamental compatibility. During the second test, the substrate is subjected to a more comprehensive battery of tests including runnability, ink-transferability, blanket-substrate compatibility, blanket-temperature operating window, and ink-substrate interaction.

The tests ensure the substrate can be used in duplex and collation modes. Upon completion of the various test procedures, a full, detailed report and printed samples for each substrate tested are provided to the supplier. If the substrate is successful, the media is approved and posted on the HP Indigo Media Solutions Locator section, a portal for HP Indigo customers.

For specific types and brands please check the [HP Indigo Media Solutions Locator on the customer portal at www.hp.com/go/medialocator](http://www.hp.com/go/medialocator)

## Can HP Indigo ElectroInk be used for printing food packaging applications?

Many of our customers around the world print flexible packaging, including food packaging, on HP Indigo presses using HP Indigo ElectroInk. ElectroInk complies with the Federal Food Drug and Cosmetic Act 21 U.S.C 201 (FFDCA) requirements for printing on the non-contact side of the following food packaging materials where the resulting packages may be used to hold all types of food at temperatures up to 212°F (also known as FDA's Condition of Use B, "Boiling Water Sterilized", under 21 CFR 176.170): (1) low density polyethylene (LDPE) that is at least 40 microns thick; (2) polypropylene that is at least 20 microns thick; and (3) polyester which is at least 12 microns thick.

**EU regulations** HP Indigo ElectroInk complies with Article 3 of the EU Framework Regulation No. 1935/2004 for printing on the non-contact side of the following food packaging materials where the resulting packages may be used to hold all types of food at temperatures up to 212°F: (1) low density polyethylene (LDPE) that is at least 40 microns thick; (2) polypropylene that is at least 20 microns thick; and (3) polyethylene terephthalate (PET) which is at least 12 microns thick. As with any packaging which contains food, our customers are required to adhere to Good Manufacturing Practices and applicable FDA requirements. It is recommended that customers perform the relevant materials analysis specific to their packaging material, together with the end user's labs. The objective of such analysis is to ensure the quality and integrity of the packaging polymers and to adhere to Good Manufacturing Practices and relevant regulations and standards applicable to the packaging material.

**Positive lists** ElectroInk fully complies with the Positive List of the Swiss Ordinance on Materials and Articles in Contact with Food (RS 817.023.21) (Swiss "Bedarfsgegenständeverordnung") article 26g. ElectroInk also fully complies with the Inventory List of the EuPIA Guideline on Printing Inks applied to the non-food contact surface of food packaging materials and articles, November 2011 version. All pigments used in ElectroInk formulations are on either list 1 or list 2 of Technical Document 1 of the Council of Europe Resolution ResAP (2005/2).

## Are any additional products recommended to enhance the adhesion of HP Indigo ElectroInk to the plastic substrates typically used in food packaging?

For food applications, we recommend the use of primer called DigiPrime produced by Michelman, which is utilized in coating a wide variety of substrates to enhance their compatibility with ElectroInk.



## Can substrates treated with DigiPrime 4431 be used for printing on food packaging applications?

Michelman confirms that the US Food and Drug Administration (FDA) has approved the use of Michelman's DigiPrime 4431 as a primer on flexible packaging without any temperature limitation, except for those consistent with Good Manufacturing Practices.

## Do HP Indigo ElectroInk products contain any chemicals listed on California's Proposition 65 list?

HP Indigo ElectroInk products do not contain any substance listed under the California Safe Drinking Water and Toxic Enforcement Act of 1986, (Proposition 65).

## Do HP Indigo ElectroInk products contain any substances on the US federal list of Hazardous Air Pollutants (HAP)?

None of HP Indigo process ink colors (HP Indigo ElectroInk) or other supplies, contain substances that are listed on the United States federal list of hazardous air pollutants established under Section 112 of the Federal Clean Air Act. 42 U.S.C. §7412.

## Does HP Indigo ElectroInk meet the criteria for Nordic Swan Ecolabeling?

The Nordic Swan criteria includes requirements as to chemicals, emission to air and water, and waste treatment. ElectroInk meets the chemical requirements of the Nordic Swan 4.3 specification for printing companies.

## Does HP Indigo ElectroInk comply with REACH regulation EC No 1907/2006?

HP Indigo ElectroInk complies with EC Regulation 1907/2006 (REACH). The products do not contain any substances on the candidate list for inclusion in Annex XIV of REACH above the threshold level of 0.1% by weight of the article. Additional information about REACH can be found at [www.hp.com/go/reach](http://www.hp.com/go/reach).

## What is the concentration of heavy metals in HP Indigo ElectroInk?

HP Indigo ElectroInk does not contain lead, cadmium, mercury or hexavalent chromium in a combined concentration exceeding 100 parts per million by weight of the ink in a dry state.

## What is HP Indigo ElectroInk's flammability rating?

The oil in HP Indigo ElectroInk has a flashpoint greater than 147°F and is not restricted for any mode of international transport.

According to the Hazardous Materials Identification System (HMIS) and the National Fire Protection Association (NFPA) system, the flammability of ElectroInk is rated at 2. (Moderate on a scale of 0 to 4).

For any specific workplace hazard warning and labeling requirements for these materials, please consult your local occupational health and safety regulations.

## Can HP Indigo prints be recycled?

As a leading printing equipment and supplies company, HP Indigo cares a great deal about the ease of recycling of paper and print media. De-inking is a key initial step in paper recycling where ink is separated from the fibers. The de-inking efficiency is evaluated by measuring the residual dirt area in the deinked and processed pulp in terms of square millimeters per square meter. Brightness is also measured and compared to a target brightness and purity of the resultant unprinted recycled paper.

HP Indigo has been researching the de-inking of its prints since 2004, with successful laboratory scale results and, more recently, a successful full-scale trial in a European de-inking mill in 2011 (see report). Research has also been conducted with leading paper research institutes including Centre Technique du Papier (CTP), Grenoble and Paper Technology and Mechanical Process Engineering (PMV), Darmstadt.

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## De-inking trial results

In November 2011, HP Indigo and Arjowiggins Graphic, an HP Indigo Preferred Media Partner, planned and conducted a full-scale mill trial using 5% HP Indigo prints at Arjowiggins' Greenfield de-inking mill in France, one of Europe's leading mills for the production of high-quality, wood-free recycled graphic arts pulp. Approximately 20 tons of HP Indigo prints, comprising various ink coverages and types of paper, were collected from Indigo's Israel R&D and manufacturing operations and shipped to France for the trial. These prints were mixed into the Arjowiggins Greenfield standard paper waste mixture at a level of 5%. The results of the trial showed that high-quality, wood-free market pulp could be produced with 5% HP Indigo prints in the incoming paper waste stream. "The mill trial, using standard Greenfield Mill process conditions, achieved saleable high quality de-inked pulp suitable for coated or uncoated paper production [and] mill process efficiencies were unaffected," said Andrew Findlay, Research and Development Director at Arjowiggins Graphic.



## Additional information on HP Indigo ElectroInk

For more information visit the HP Indigo web portal at [www.hp.com/go/graphic-arts](http://www.hp.com/go/graphic-arts). Material safety data sheets can be found at [www.hp.com/hpinfo/globalcitizenship/environment](http://www.hp.com/hpinfo/globalcitizenship/environment).

Performance data presented in this document represent results obtained using specific press models, workflow versions, applications, media types and other variable testing components. Variations in performance may be expected when tests are carried out using different components. Users are therefore encouraged to perform their own tests under conditions typical of their own printing process.

**Note:** This document is relevant to the following presses: HP Indigo 10000 Digital Press, HP Indigo 7600 Digital Press, HP Indigo 7500 Digital Press, HP Indigo W7250 Digital Press, HP Indigo W7200 Digital Press, HP Indigo 7000 Digital Press, HP Indigo WS6000p Digital Press, HP Indigo WS6600 Digital Press, HP Indigo WS6000 Digital Press, HP Indigo 5600 Digital Press, HP Indigo press 5500, HP Indigo press 5000, HP Indigo VWS4600 Digital Press, HP Indigo press ws4500, HP Indigo press ws4050, HP Indigo press ws4000, HP Indigo 3550 Digital Press, HP Indigo press 3500, HP Indigo press w3250, HP Indigo press w3050, HP Indigo press 3000, and HP Indigo press w3200.

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